Thesis
Reports
Bucklew,
R.F.

S92 0104
Thesis/
Reports
Bucklew,
R.F.

BUCKLEW

PROTECTION AND INTERPRETATION OF CULTURAL RESOURCE SITES

National FS Library
USDA Forest Service
NOV 9 2011
240 W Prospect Rd
Fort Collins CO 80526

Roger Bucklew 1983
SHAWNEE NATIONAL FOREST

87

PROTECTION AND/OR INTERPRETATION

OF

ARCHEOLOGICAL SITES

A procedure to develop objectives, alternatives and a decision for the protection and/or interpretation for a site.

BY

Roger F. Bucklew
District Ranger

Shawnee National Forest
Vienna Ranger District
Route 1
Vienna, IL 62995

February 1983

A Student Project for the Clemson University Short Course - Professional Developement for Outdoor Recreation Management, Clemson, SC

TABLE OF CONTENTS

Abstract ii

Vicinity Map iii

Acknowledgements iiii

Topographic Map of Millstone Bluff iiiii

Chapter I

Introduction 1

Statement of Problem 2

Hypotheses 2

Delimination 3

Definitions 4

Basic Assumptions 5

Limitations 5

Significance 5

Chapter II

Literature Review 8

Chapter III

Principles To Use In Site Analysis 32

Chapter IV

Case Study 39

Chapter V

Introduction 51

Summary of Procedures and Findings 53

Conclusions 54

Implication 54

Recommendations 56

Bibliography 7, 31

Appendix No:

1 - Media Cost 57

2 - Site or Area Questionnaire 67

3 - Soil Legend and Map 70

4 - Contacts For Sign Media 74

5 - Protection and/or Interpretation Key 75

6 - Brochure, "Cahokia Mounds" 77

7 - Article, "The Stone Forts of IL" 78

8 - Article, "A World Landmark" 84

9 - Incremental Analysis 85

10 - Interpretive Project Plan 93

ABSTRACT

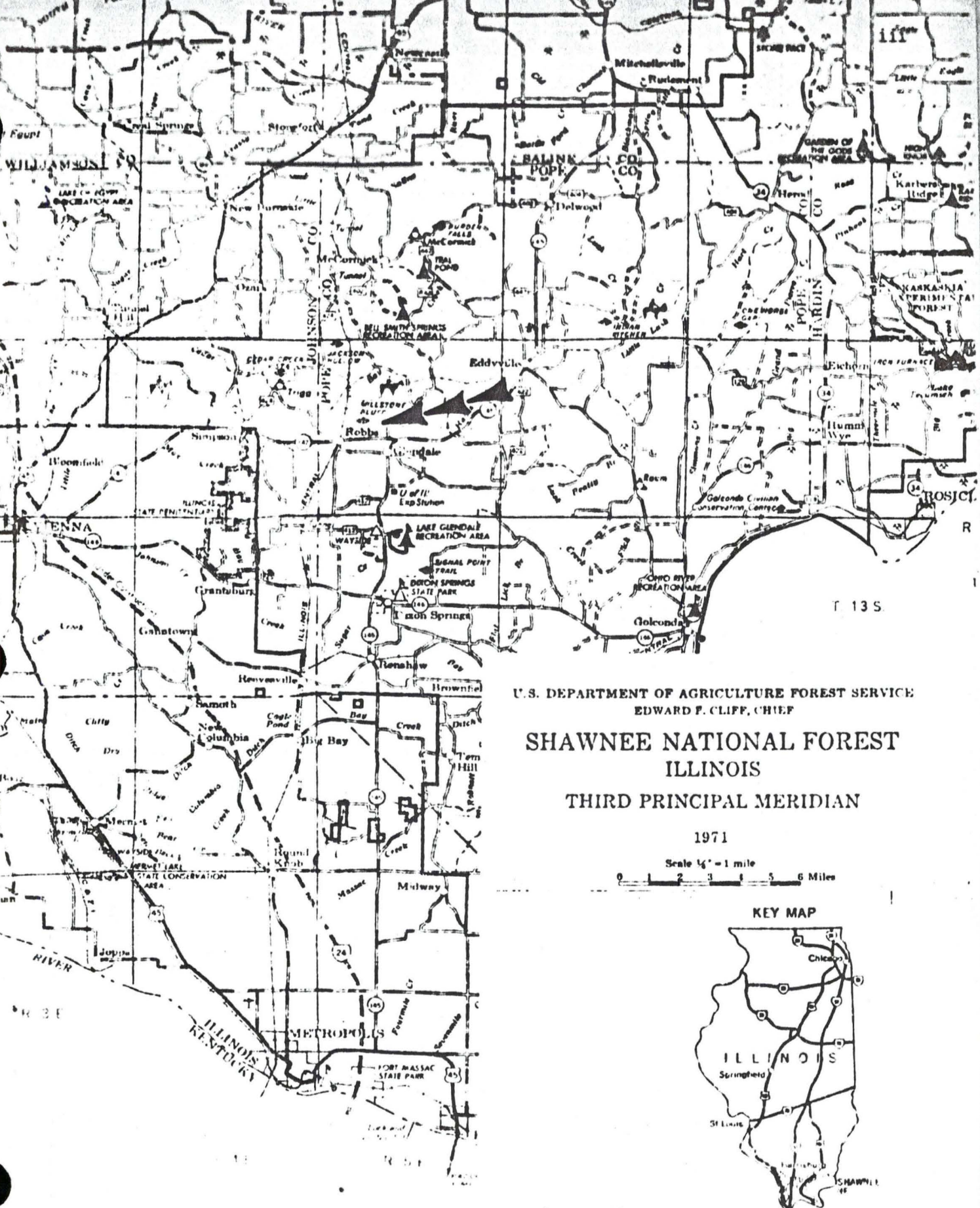
Within the Shawnee National Forest there are numerous archeological and historic sites. Several of the more well known areas are being slowly degraded by both careless users and vandals.

The areas of primary concern are those that are already well known and are attractive features, with substantial recreational appeal.

While the land manager's primary objective in managing these resources is protection, a case can be made to provide for public use with the potential to also increase the level of protection provided.

This report suggests that use by intelligent and informed people will not be detrimental but could be the means of providing a standard of use that would improve protection of specific areas and the resources in general.

Through the study of a specific area, actions can be analyzed that should lead to a better informed public, with the consequent benefit of better informed use and protection for the area. It is the conclusion of this study that intelligent use of our known non-renewable resources is the only practical and economical protection available.



U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE
EDWARD P. CLIFF, CHIEF

SHAWNEE NATIONAL FOREST
ILLINOIS
THIRD PRINCIPAL MERIDIAN

1971

Scale ½" = 1 mile

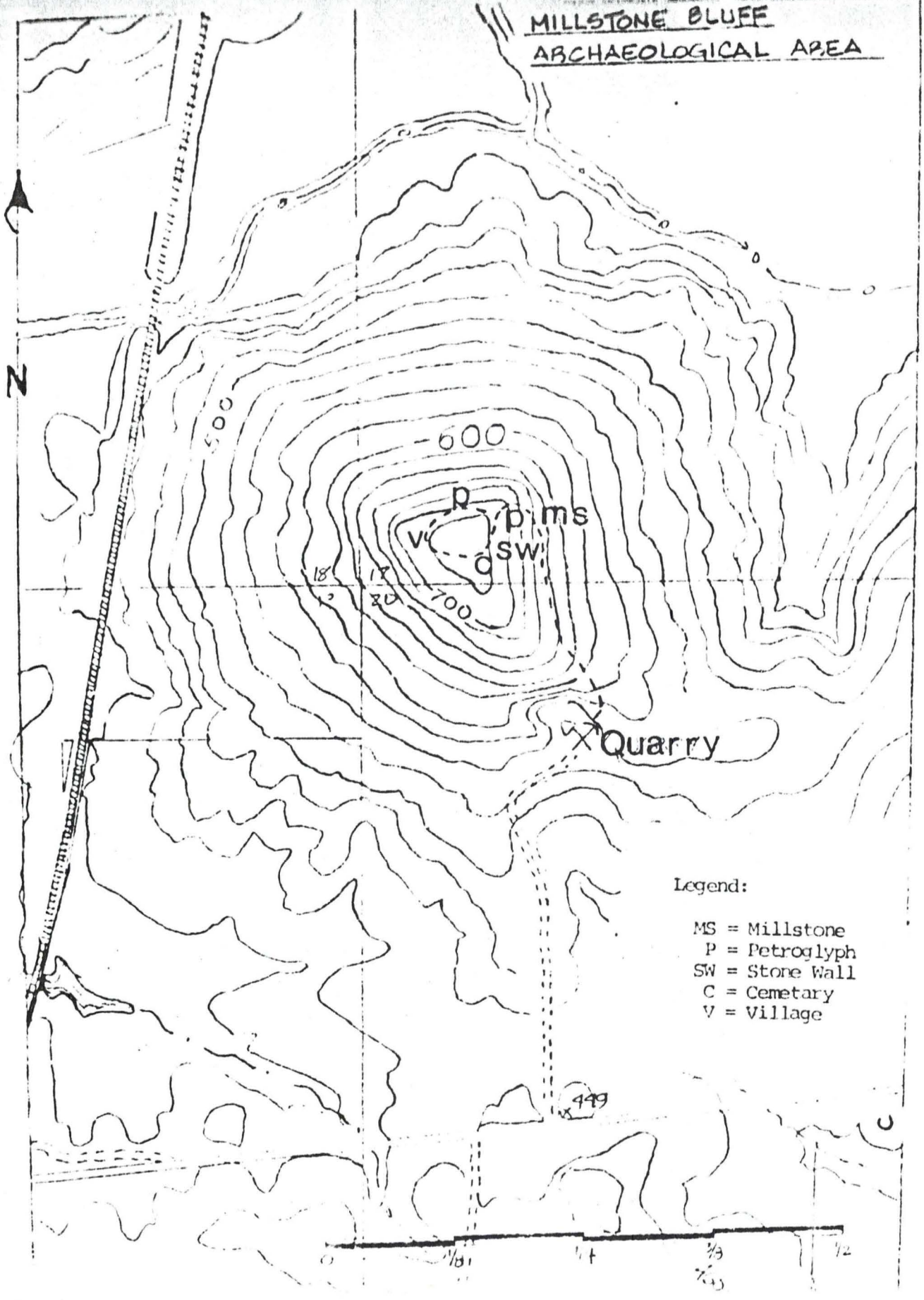
0 1 2 3 4 5 6 Miles

KEY MAP

ACKNOWLEDGEMENTS

This report is a product of assistance provided by the Forest Archeologist, Daniel Haas; Regional Archeologist, Judith Propper; Regional Interpreter, Craig Whitney; Forest Soil Scientist, Jerry Freeouf; Forest Landscape Architect, Jim Chidsey.

Thanks to Gail Hemphill for assistance in copying the petroglyphs and art work. Thanks to all the District personnel who helped. A special thanks to Deborah Caraker and Janice Taylor for typing and numerous errands.


MILLSTONE BLUFF
ARCHAEOLOGICAL AREA
N
600
700
P
MS
V
SW
Quarry
Legend:
MS = Millstone
P = Petroglyph
SW = Stone Wall
C = Cemetary
V = Village
449

CHAPTER I

Introduction and Statement of the Problem

The area of southern Illinois known as "the land between the rivers"[1] has had human occupancy, some believe, for as far back as 19000 years. Some studies at Modoc Rock Shelter have placed human occupancy around 8000 B.C.. The fertile bottom lands, hardwood uplands, and rivers and streams provided an area well suited to the early occupants. Abundant fish and game for the earliest dwellers and fertile farm fields for the later, has produced a wealth of archeological resources that contribute to the American heritage.

Within the general area of concern there exists, and is being developed, a large significant archeological area, Cahokia Mounds State Historic Site. This area is reported to contain the largest man made earthen structure north of Mexico and also the largest prehistoric earthen construction in the New World.[2] As a consequence of the richness of artifacts present and their abundance, a recreational activity has developed, that of artifact hunting or "arrowhead hunting". Within the culture of the southern Illinoisan, as well as nationally, is a well developed pattern of pursuing collections of items left behind by our predecessors. Unfortunately, the ancient people buried, with their dead, items highly prized by our more modern occupants. As a consequence, grave robbing of the prehistoric sites is commonplace. It is not uncommon to see short dissertations on television by local "hunters" demonstrating ways to probe for pots and evidence of burials.

Due to many factors, the knowledge of the need to protect our past heritage is not a commonly held idea within most of our population. This is not to say that every flint chip is worthy of protection. One of the apparent criteria to be used in assessing an area for protection would be to determine to what extent it could be protected through informed use and how that would or could affect the level of consciousness of the users toward the need for protection of sites in general. This area of study has been identified as a fertile area, basically untouched by researchers (Driver, B.L. 1979)[3].

STATEMENT OF PROBLEM

The need to protect the nonrenewable resources has existed for a long time. The desire and need to use and enjoy these same resources is of the same magnitude.

The problem faced by resource managers is primarily how to provide the necessary protection and secondarily, accomodate the wishes of the recreation user.

This report will explore ways to protect an archeological site. Protection includes the preservation of all the knowledge contained by the resource and the artifacts.

HYPOTHESES

The principle idea is that an informed, intelligent people conduct themselves with sensitivity toward the demanded resources. It is accepted that merely providing the necessary information rarely achieves

the objective of producing an informed user. Through the use of techniques developed in interpretation, a better level of understanding can be achieved. That interpretation can be used to help people understand how the world works and thus prepare them for responsible citizenship (Wagar, J. Alan 1976).[4]

That, through education (interpretation) we can produce an informed user and control his conduct and behavior toward specific resources. That within any population of users there are portions that react toward specific uses and experiences in a predictable manner. ie: There is a portion that uses opportunities carefully and intelligently (considered to be in the majority 85%), and a portion that uses opportunities carelessly, because they are unaware of the consequences of their action (considered to be a minority 5 to 10%), and a portion that uses opportunities maliciously and are not amenable to correction except through legal sanctions (considered to be a minority not more than 5%). Attached to this thought is that in a group or in a mix of different groups, these proportions exist and the careful users attitude and conduct is reflected in the behavior of the entire group.

DELIMITATION

This study will not be able to explore through a data gathering process any definitive answers, but will look at processes and procedures a manager can use to establish the basic objectives and opportunities a given area may represent. Examples of analysis made on a specific site will be presented in the appendix for clarification on the arrival of some of the conclusions. The interpretive plan will be developed up to the interpretive story level and final messages will be done at a later time. This interpretive plan is found

in the appendix. An example on incremental analysis is presented in the appendix to show one way of arriving at the appropriate actions for a site.

DEFINITIONS

For the purposes of this paper the following terms are defined as follows:

Interpretation - "An educational activity which aims to reveal meaning and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than to simply communicate factural information."

Protection - The method or procedure to stop, or slow, the loss of the actual artifact, site or area, or the loss of the information that it might contain.

P.A.O.T. - Persons At One Time - a planning term to denote developed capacity.

R.V.D. - Recreation Visitors Day - an aggregate of 12 hours of recreation activity. This can be one person for twelve hours or twelve peole for one hour.

Visit - One person each time they visit a site. A measure of how often someone arrives at a site.

Carrying Capacity - The maximum number of visitors that can use a site without site deterioration. Also used in context of recreation experience as that maximum number that will not detract from the users enjoyment.

BASIC ASSUMPTIONS

The major overriding assumption that well informed users will be intelligent users of delicate resources is central to the development of any interpretive effort. The education of users to produce intelligent users, while not totally supported by experience or research, is often alluded to as an area that shows promise for managers to delve into. This premise, along with the thought that the majority of the people, when they know the consequence of their actions, will respond favorably toward the protection of the resource. Another area of human behavior felt to be true is that most everyone will provide help if just asked and informed how it will benefit both them and the requester.

LIMITATIONS

This developed process will need to be tested against several sites to determine if it is comprehensive enough to cover all contingencies, or if there are additions needed. An attempt to solicit change in people's behavior will be part of this process. Time will tell if deterioration continues on sites within the Shawnee National Forest. Human behavior is well studied, but not completely understood, therefore certain changes may be necessary as the state of the art advances.

SIGNIFICANCE

If it can be shown that properly developed areas can be used and protection improved at the same time, much of the present costs of

negative restrictive management can be converted to positive management. Public education and support will go a long way toward reducing costs faced by resource managers.

The future manager will be much better equipped to perform the tasks assigned him as he will be able to draw on the efforts of past managers in dealing with the resources entrusted to his care. Without our efforts and continuing research into both the behavioral aspects as well as the social context of the recreation user, the future manager will find as many voids as we find today. It can be shown that both hard line enforcement and soft sell guidance are effective strategies for resource management (Wagar J. Alan 1975)[5]. However, which is the most cost effective in the long run still remains a mystery.

BIBLIOGRAPHY

1. Shawnee Forest Guide to Southeastern Illinois; Copyright 1976, S. D. Haney

2. Cahokia Mounds - Pamphlet published by State of Illinois Land and History Sites, 50M-5-78

3. Driver, B. L., 1979

4. Wagar, J. Alan - 1976, Why Interpretation? ; A paper prepared for Great Lakes Regional Conference Association of Interpretive Naturalists, Carbondale, IL, Sept. 10, 1976.

5. Wagar J. Alan - 1975, Recreation Insights From Europe; Journal of Forestry, Vol.73, No.6, June 1975.

Chapter II

Literature Review

Everyone alive today is a steward of the past. The choice is ours whether we will preserve the manuscripts, objects, and other sources of information from which future generations may learn about those who preceded us - or whether, intentionally or through neglect, we will allow our heritage from the past to be destroyed. If we do not preserve this information, all future generations will have lost forever the ability to experience and profit fully from the past. We must exercise a stewardship over these resources with vigor and with a sense of urgency.

Much information about the past still lies buried in the ground awaiting investigation. But technical achievements over the past 50 years and the great increase in population have enabled us, in fact have forced us, to alter drastically much of the surface of the earth. The rate at which the landscape is being changed is ever-increasing and there is reason to believe that within another 50 years very little land in the United States will remain totally untouched. Some remnants of the past will survive, of course, but unless we take appropriate steps now, the scattered evidence which will remain will not be enough to permit scientists to recreate a full and meaningful picture.

We cannot postpone our responsibility. We cannot wait until it is more convenient or until there might be more funds from which to make appropriations, for there is no more time. (Stewards of the Past, Mississippi Alluvial Valley Archeological Program).

The protection of archeological resources has been a problem that spans from the distant past to the present day. Present day land managers are faced with protection of sites and areas of varying significance.

The task of protecting archeological and historical resources has been accepted by society at large and has resulted in the establishment of several acts of congress to preserve, restore, and maintain for the inspiration and benefit of the people. The first act, The Antiquities Act of 1906[1], was followed by the Historic Site Act of 1935[2] and more recently The National Historic Preservation Act of 1966[3]. In conjunction with these acts the National Environmental Policy Act of 1969[4] was established as the process to, "the extent possible, be combined with other statutory obligations"- such as the National Historic Preservation Act and Executive Order 11593[5] - "to yield a single document which meets all applicable requirements"[6].

Cultural resource management is not an entirely new concept in the Forest Service, a conservation-oriented agency with a long tradition of multiple-resource planning and management. Although its major program emphasis centers on natural resources - timber, wildlife,

water, forage, outdoor recreation - the Forest Service is responsible for providing leadership in the management, protection and wise use of all resources on National Forest lands for the benefit and enjoyment of the American people. For this reason, obvious historical and archeological resources have long been appreciated and afforded protection by the Forest Service as a matter of course; however, it was not until fairly recently, within the past ten years or so, that a more active cultural resource management program began to be developed. This came about as part of a growing national awareness and concern that much of our national heritage was being lost as the rate and intensity of mechanized agricultural and construction activity increased.

This concern resulted in legislation which directed the Federal Government to take the lead in developing a national historic preservation program. It was recognized that countless historic buildings, structures, and entire neighborhoods, were being destroyed with little or no consideration for their potential historic, architectural, or cultural values. It was also becoming apparent that reliance on the techniques of salvage archeology, or the "stop-the-bulldozers-if-you-hit-anything" approach, was an inadequate strategy for identifying, protecting, and preserving significant archeological sites. With establishment of the National Register of Historic Places in 1966, the Federal Government began a program to promote and encourage efforts for historic preservation at the state, local, and national levels. This was accomplished at the state and local levels primarily through

the development and expansion of Federally-assisted programs and grants-in-aid. At the national level, a number of laws, regulations, and an Executive Order were instituted directing Federal agencies to give careful consideration to the effects their undertakings and projects might have on cultural resources. The basic Federal policies and procedures for the protection of cultural resources are set forth in the following documents:

Antiquities Act (1906) This early Act prohibits and establishes criminal sanctions for, the unauthorized destruction or removal of archeological and historic remains from Federal land. It provides for scientific investigation of these remains, subject to permit and regulations.

National Historic Preservation Act (1966) This Act establishes the National Register of Historic Places and the Advisory Council on Historic Preservation. Section 106 directs that Federal agencies, prior to the initiation or authorization of an undertaking, shall "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in the National Register", and shall afford the Advisory Council the opportunity to review such undertakings.

National Environmental Policy Act (1969) This Act declares that it is the policy of the Federal Government "to preserve important historic, cultural, and natural aspects of our national heritage" and directs Federal agencies to demonstrate compliance with this policy, and with other Federal laws and regulations designed to protect the environment, as a part of project planning and execution.

Executive Order 11593 (1971) This Order directs Federal agencies to inventory the lands under their jurisdictions in order to locate and evaluate cultural resources. Those sites which are determined to be eligible for the National Register of Historic Places are to be nominated to the Register. Until this inventory and evaluation process is complete, Federal agencies are directed to "exercise caution...to assure that any Federally-owned property that might qualify for nomination is not inadvertantly transferred, sold, demolished, or substantially altered."

36 CFR 800 (1974) This part of Title 36 of the Code of Federal Regulations sets up the "Procedures for the Protection of Historic and Cultural Properties." It directs Federal agencies to follow certain steps in order to comply with the requirements of the National Historic Preservation Act and Executive Order 11593. 36 CFR 800.4 states: "As early as possible and in all cases prior to agency decision concerning an undertaking, the Agency official shall identify properties located within the area of the undertaking's potential impact that are included in or eligible for inclusion in the National Register." If such properties are identified, a determination of effect must be made. In cases of adverse effect, mitigation measures must be sought in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. The criteria and procedures to be used in determining National Register eligibility and in making determinations of effect are outlined in these regulations.

The Archeological and Historical Conservation Act (1974) Also known as Public Law 93-291 or the Moss-Bennett Act, this Act amended the Reservoir Salvage Act of 1960 to include all terrain-altering projects. It authorizes Federal agencies to expend project funds to protect or recover historic and archeological data threatened by Federal construction projects or Federally-licensed activities or programs.

With the establishment of this national direction, the Forest Service and other Federal agencies began to develop internal guidelines for the implementation of the various acts and regulations. Forest Service policies and guidelines were set forth in Chapter 2360 (Special Interest Areas) of the Forest Service Manual, under 2361 - Cultural Resource.

POLICIES FOR CULTURAL RESOURCE MANAGEMENT

From FSM 2361 - Cultural Resources (Title 2300-Recreation Management, Amendment No. 80, October 1978).

2361 - CULTURAL RESOURCES. The cultural foundation of our Nation includes buildings, sites, areas, architecture, memorials, and objects having scientific, historic, or social values. These comprise an irreplaceable resource relating to past human life.

The cultural resources of the National Forests are a nonrenewable resource of growing importance to outdoor recreation. Much evidence of the past, such as artifacts and architecture, is extremely fragile and can be obliterated by relatively minor modifications

of the ground surface. The resource is increasingly threatened by development, public use, and vandalism. The damage is frequently subtle and inconspicuous and often can only be recognized by a professional or trained person.

Cultural properties and areas have not only local scientific interest and significance, but are elements of world-wide patterns and processes. The integration and analysis of information from diverse areas contribute to a better understanding of human kind and its environment.

National Forests contain much of the undisturbed evidence of early habitation in America. The remoteness of much National Forest land has limited the impact on these cultural resources. Increasing public use of the outdoors and the intensified development of public lands are increasing the probability that cultural resources may be damaged or lost. Prompt and effective action is necessary to integrate cultural resources into multiple-use management of the National Forest System.

The goal of the cultural resource program as a part of multiple-use management in the National Forest System is to manage these resources for the following purposes:

1. Preventing loss or damage of cultural resources until they can be evaluated for scientific study, interpretative services, or other appropriate uses.
2. Integrating the cultural resource program into multiple-use management of the National Forest System.

3. Scientific study to gain knowledge about past human behaviour.
4. Interpretation so that the public may gain a better understanding and perspective of our heritage.

- - - - - - - - - - - - - - - - - -

2361.02 - Objectives The following minimum objectives will be met.

1. Complete an inventory of cultural resources on all National Forest System land by 1985 sufficient to provide a data base for land management planning.
2. Complete an inventory of all cultural resources on National Forest System land by 1990.
3. Until these inventories are complete, exercise caution to ensure cultural resources are not damaged, destroyed or transferred by meeting the coordination requirements outlined in FSM 2361.3.
4. As part of the decision making process, document inventory and evaluation procedures to ensure adequate participation by cultural resource professionals.
5. Perform inventories at appropriate levels prior to initiating project actions.

2361.03 - Policies

1. Manage cultural resources as a nonrenewable resource to maintain their scientific, historical, and social integrity.

2. Complete an inventory of all cultural resources on National Forest System land by 1990.

3. Until these inventories are complete, exercise caution to ensure cultural resources are not damaged, destroyed or transferred by meeting the coordination requirements outlined in FSM 2361.3.

4. As part of the decision making process, document inventory and evaluation procedures to ensure adequate participation by cultural resource professionals.

5. Perform inventories at appropriate levels prior to initiating project actions.

2361.03 - Policies

1. Manage cultural resources as a nonrenewable resource to maintain their scientific, historical, and social integrity.

2. For cultural resources located on National Historic System lands, follow the requirements of the National Historic Preservation Act, and Executive Order 11593, in adding qualifying cultural resources to the National Register of Historic Places as outlined in FSM 2361.21.

3. Maintain appropriate contacts with other Federal, State, and local organizations regarding cultural resource management activities on National Forest System lands.

4. Provide for use of cultural resources for educational,

scientific, recreational, and other public purposes to the extent consistent with management requirements.

5. Include cultural resource management requirements in all resource use and development programs and multiple use land management planning.

6. Conduct cultural resource recovery programs only with the direction of qualified professionals.

7. Provide for cultural resource management to ensure properties and their records are protected from unauthorized uses. Such management should include the exercise of confidentiality whenever disclosure of data to the public would risk possible degradation of the resource.

- - - - - - - - - - - - - - - - - - - -

The protection portion of the requirements has ranged from locking up, to full restoration and display of the various resources. Entire communities such as Williamsburg, Virginia[7] have been restored and made available for the public to enjoy. The process of providing the information from the past and displaying the life styles of the occupant has produced a method of communication most often called interpretation. "interpretation is an educational activity which aims to reveal meaning and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than to simply communicate factual information".[8] Embodied within the meaning of interpretation are several concepts which include revelation, preservation, use, under-

understanding, appreciation and protection. One of the concepts to accomplish the goals of interpretation is to "capitaize mere curiosity for the enrichment of the human mind and spirit".[8] Tilden, in his book, Interpreting Our Heritage,[8] develops six principles of interpretation. Basically they are:

1. Interpretation's primary purpose is provocation, not instruction.

2. Interpretation is revelation based on information. It is not the presentation of information.

3. Interpretation must relate what is being displayed or described to something within the personality or experience of the individual.

4. Interpretation is an art, combining many arts. An art can be taught and successfully learned.

5. Interpretation must relate the complete story and should relate to the whole person.

6. Interpretation for children should be specially prepared and not be a dilution of the adult version.

Any interpretive effort that would successfuly incorporate these principles could have a greater expectation of meeting

the established goals.

One of the principal responsibilities of the land manager is "to protect the characteristics of the resources and facilities that give these resources their recreational worth". (Driver, G.L. 1979) Inherent in this precept is that the manager must have technical expertise relevant to his specific function, whether it be the protection of a ruin or care of a delicate specimen.

Driver further states: "Protection of resources is dependant upon some type of control on the behavior of users". The controls can be arranged in a sequence that ranges from negative to positive (Carson and Driver, 1968). This ranking reflects the relative ease with which the controls can be established, which helps explain the tendency for managers to employ the more negative or aversive types. This ranking would include complete prohibition; spatial or temporal zoning; physical design modifications; rationing mechanisms, including prices; and psychological inducements to use alternative resources; education and attitude formation (with respect to individual responsibility toward the resource) without positive incentive; and education with positive incentive. These controls and the fact that there is a disproportionate emphasis on the negative controls pose

a set of interesting questions to which the psychologist can apply his skills. As one example, if user education is employed as a control, how should the program be developed for a specific purpose? Should there be off-site as well as on-site programs? Should the programs be directed at children, adults, or both? How should they be scheduled over time?

These particular thougnts drive to the heart of the problems faced by land managers in dealing with protection and or interpretation of cultural resource sites.

In addition to the foregoing, Driver expresses a concern on appropriate levels of development and management to make recreation services available. Some decisions are required to establish what level and rate of use is desirable. Also, what facilities, how much development and program promotion are required, and who will pay the cost. In making these decisions the land manager needs to be cognizant of carrying capacity of the resource. Sometimes this capacity is detined solely in terms of what the resource will bear. More commonly, the value is determined after considering several factors, such as the capacity of the resource to withstand use, the level of investment that can be made in the resource to increase its capacity, and the users value or objectives which can be considered a type of psycho-sociological carrying capacity. Out of this needs to be developed some criteria that allow a land manager to reach a balance between the respective values.

Several other factors discussed by Driver are:

1. To provide opportunities to meet the needs of the recreationist that lead to his selection and use of the resource. This is an area where much research is needed as traditionally demand has been equated to people standing at the door and the recreation product as those same people as they pass back out the same door. This tells one little about what the true demand is and how well that demand was met. A more creative measure of output will need to evolve before land managers will be able to truely know whether his product satisfys the latent demand. At present intuitive measures are all that exist.

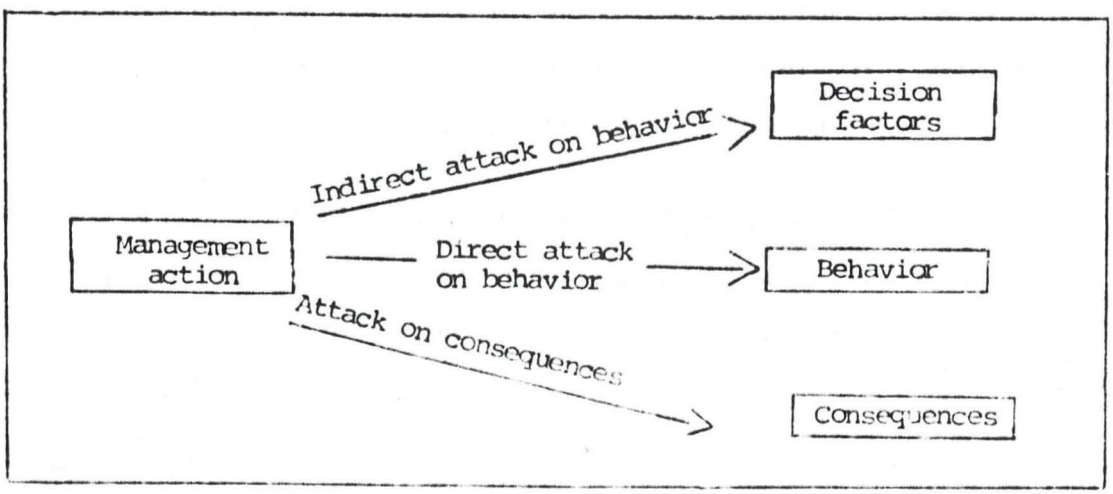
2. To assess the extent and situational context of the recreation resource. This planning function includes inventorying, classifying and zoning; appraising the resources within their larger context, identifying complimentary, duplicate and conflicting uses. Included with these are also, variables like distance, accessibility to points of origin of potential users; identifying hazards; and assessing relative values in terms of scarcity, delicacy, uniqueness, carrying capacity, clientele served, and cost-sharing responsbilities.

3. To enhance the experience of the user, this concept overlaps the development and management area previously discussed. In addition, the manager must design, plan, and develop the resource in such a way that the users experience, or his satisfaction, from the engagement will be enhanced. Conflicting uses within a given area must be controlled or eliminated.

4. To appropriately publicize the program to meet the objective of management. Here the objectives established will dictate the kinds and amount of publicity desired. Also available here, is the ability to educate the user or potential user and achieve support and control for your program.

The real problem to be confronted by the recreation manager will be the "People" problem. The physical site and desired management actions readily lend themselves to analysis and design. The actions or behavior of the people is not such an easy problem to solve. In a paper published in the Journal of Forestry by G.L. Peterson & D.W. Lime, 79 the following process was discussed.

There is a rationale process to use in working ones way through the intricacies of people behavior. For example, the "behavioral systems" approach. "A need for management arises when something people do, or might do, has unacceptable consequences to the resource, to the user, or sometimes to the manager." Management can occur at different points in the "behavioral system" depicted in figure 1.



The undesirable behavior may be attacked indirectly by modifying decision factors, or directly through regulation and enforcement. Sometime you will want to leave the behavior alone and attack the consequences."

Good managers, through training experience intelligence and common sense have an intuitive feel for problem identification and solution. They frequently make good decisions without tedious data gathering. However, a need exists to also be aware of ones limitations and recognize complex problems that require special treatment. There are at least five factors in problem analysis that need to be considered. They are:

1. "Explicit understanding of the objectives that define the problem. The objectives include those of public policy, the agency and the manager, the non-recreation needs, and the recreationists (users' objectives are always pluralistic and often not easily understood, e.g., Driver 1976, Tinsley et al. 1977). Management objectives should define, as specifically as possible, the kind of recreation opportunity or opportunities the area under question is to provide. These objectives should be realistic and attainable, and, where possible, they should be quantified in terms of measurable criteria so that achievement can be evaluated.

2. Understanding of the resource, including its static characteristics and the dynamics of response to various amounts and types of use and to management.

3. Understanding of human behaviors, i.e., what are the behaviors and what are the decision factors behind the problem?

4. Identification of all significant alternative courses of action to solve the problem(s). These alternatives should not be limited to the convenient or obvious ones, such as allowing a given situation to go unchecked or drastically restricting it. They should represent a thoughtful and creative effort to determine the different ways the problem might be attacked.

5. Assessment of the constraints for getting the job done, including legal, political, technical, and financial limitations as well as availability of manpower.

The manager in developing the objectives needs to keep in mind his basic responsibilities. These are:

1. To conserve public funds.
2. Respect constitutional rights.
3. Comply with due process requirements.
4. Avoid unauthorized actions.

Under these responsibilities the manager has at least three objectives:

1. To preserve and protect the resource. The manager is a caretaker of public property and manages it in trust for the public interest.

2. To protect the user, within the limits of public policy, from harm in connection with his use of the resource. The manager is a protector of public health and safety.

3. To provide, preserve, and enhance satisfying recreational opportunities. The manager is a provider of opportunity.

Whenever the behavior of recreation users threatens the resource, threatens themselves or other recreationists, depreciates recreational opportunities, or imposes unreasonable or inequitable public expenditures, action may be required. The manager should not, however, allow the roles of caretaker, protector, and provider to get ahead of his more fundamental responsibilities.

A Framework To Solve Problems

Depending on the manager's objectives and the nature of the problem, strategies generally fall into one or more of four types:

1. Improvement of the ability of the resource to serve the desires of the public.
2. Making the resource more durable.
3. Shielding users from harm.
4. Controlling the way people behave.

The first three are largely single-purpose strategies. Controlling the way people behave, however, is a versatile approach. For example, if congestion is diminishing user satisfaction and causing resource damage, there may be ways to redistribute use spatially or temporally through control of behavior.

The specific programs to implement these strategies are made up of at least four actions. These are:

1. Changes in the resource, which include various site management options such as development of facilities, landscaping, and construction of paths and barriers.
2. Changes in users which include results from actions that modify perceptions, attitudes, skills and vulnerability of people.
3. Changes in the legal and administrative framework, which includes rules, regulations and procedures by which the resource and its users are governed.
4. Provision of services which channels the user, i.e., transportation services or trail guides.

The control of people behavior can be reduced down to five basic concepts.

1. Regulation
2. Licensing
3. Manipulation of fees
4. Site design and delivery of services
5. Information and Training

Further discussion of these ideas will help to better understand the ways in which these concepts can function.

Regulation is the direct prescription, by means of rules or laws, of the behavior that is or is not allowed. Regulation is usually negative in that it generally defines what may not be done. The legal basis is the police power of government. The concept is that a person does

not have the right to do things that damage public health, safety, or welfare.

Prescription of behavior by rules and laws may sometimes be necessary and appropriate, as with vandalism or theft. In other cases it may be too obtrusive. The effect is always strongly dependent on enforcement and enforceability. A law that goes strongly against public preference may not be enforceable - prohibition was an example. A law that is not aggressively enforced may not be obeyed, as experience with the 55 mile speed limit has demonstrated. Indeed, improved enforcement of existing rules is often an effective way to change behavior.

Licensing is the conditional granting of privileges that would otherwise be illegal. Driving a motor vehicle is a privilege, not a right. The privilege to drive a specific type of vehicle can be obtained by passing an examination, paying a fee, and agreeing to obey the rules of the road. Licensing is an important technique for controlling behavior. It can be used to impose qualifications, to restrict the rate or place of entry into a recreation area, and to limit the kinds of activities permitted and to specify when and where they will take place (Stankey and Baden 1977). For example, licensing could be used on a whitewater river to control the kinds of watercraft and exclude unqualified boaters. In a large wilderness like the Boundary Waters Canoe Area, entry licenses or permits are an unobtrusive way of controlling the intensity of use (Gilbert et al. 1972, Hulbert and Higgins 1977).

Fees traditionally are imposed by public agencies for generating revenue and paying for services. They can and do influence behavior strongly, and their effects should be assessed carefully if unpleasant surprises are to be avoided. If two otherwise equivalent opportunities have different prices, people generally will pick the one that costs less. Thus, in concept, fees can be used to control behavior, but few public agencies have used them intentionally for this purpose.

It may be possible to manipulate revenue fees and service charges so that desirable behavior occurs. The telephone company's graduated rate structure is an example of service charges that channel behavior. By setting higher rates for service at peak hours, the company encourages people to call at uncongested times.

Where geographic or temporal redistribution of use would relieve congestion, manipulation of fees is worth considering as an unobtrusive or indirect alternative to use rationing. Rationing might be preferred, though, if it is decided that ability or willingness to pay should not be the basis for excluding people at congested times or from congested places.

Site modification and delivery of services can change behavior either by imposing constraints or by offering incentives. For example, trails and pathways are attractive places to walk. They also tend to encourage visitors to go to destinations served by the paths. Guides and transportation services similarly tend to channel travel. On the other hand, physical barriers obviously act as constraints.

Managers can control the kind of use an area gets by manipulating the facilities and services provided. A campground with showers, picnic tables, drinking water, fireplaces, and electrical and sanitary hookups will not attract the same kinds of users as a primitive campground, even though the two may be in very similar geographic settings.

Information and training, along with provision of technical services, may be useful in indirectly changing or persuading the recreationist to act acceptably.

Warning signs at points of access to whitewater rivers will tend to discourage use by people who lack skills or equipment. Brochures, films, and advertisements can teach principles or environmental protection. Publications describing canoeing and hiking trails will help people select locations that are consistent with their desires, skills, and equipment. Offering guided tours will tend to gather individual users into manageable groups.

In summary, it can be seen that control of people behavior has primarily centered around direct control with little effort being expended toward the indirect approach. The area of information and training appears to be a fertile area for managers to delve into. Many problems of todays managers are directly traceable to the basic lack of understanding of how the world works and the interrelationships that exist between all things.

There exists a direct link between the legal requirements for protection and the opportunity for interpretation. A lot of further work is needed in the field of behavior before managers will have definite answers as to how to best achieve both user control and least restricted enjoyment of specific recreation resources.

It is a basic precept that, 'intelligent use of our known nonrenewable resources is the only protection that is both economical and practical'.

1. The Antiquities Act of 1906 (34STAT225, 16U.S.C. 431 et seq)

2. The Historic Sites Act of 1935 (49STST666, 16U.S.C. 461 et seq)

3. The National Historic Preservation Act of 1966 (80 Stat 916, 16U.S.C. 470 et seq)

4. The National Environmental Policy Act of 1969 (83 Stat 852, 42U.S.C. 4321 et seq)

5. Executive Order 11593, Federal Register, Vol 36 No 95, Saturday, May 15, 1971.

6. Federal Register Title 36, Chapter 8, Part 800, FR Vol 39 No 18, Friday, January 25, 1974.

7. Alexander, Edward R.1971; The Interpretation Program of Colonial Williamsburg.

8. Tilden, Freeman, 1967; Interpreting Our Heritage.

9. Driver, B.L., 1979; Potential contributions of Psychology to Recreation Resources Management.

10. Carson D.H. & Driver, B.L., 1968; An environmental Approach to Human Stress and Wellbeing, With Implications for Planning.

11. Driver, B.L. 1976. Quantification of outdoor recreationists' preferences. P.165-187 in Research: Camping and Environmental Education. B. van derSmissen, ed. Pa. State Univ. Health, Phys. Educ. and Recreat. Ser. 11.

12. Gilbert, C.G., G. L. Peterson, and D.W. Lime, 1972, Toward a model of travel behavior in the Boundary Waters Canoe Area. Environ. and Behavior 4:131-157.

13. Hulbert, J.H., and J.F. Higgins, 1977. BWCA visitor distribution system. J. For. 75: 338-340.

14. Stankey, G.H., and J. Baden, 1977. Rationing wilderness use: methods, problems, and guidelines, USDA For. Serv. Res. Pap. INT-192. 20 p.

15. Tinsley, H.E.A. T.C. Barrell, and R.A. Kass, 1977. Leisure activities and need satisfaction. J.Leisure Res. 9: 110-120.

CHAPTER III

To this point the legal requirements, the social context, psychological implications and method to communicate with the recreation user has been reviewed to see if there exist any well established formulas to both interpret and protect the resources at the same time. While no cut and dried formula was found several principles were discovered that should help chart a course toward establishing sound alternative development.

PRINCIPLES TO USE IN SITE ANALYSIS

Management responsibilities:

1. Conserve public funds
2. Respect constitutional rights
3. Comply with due process requirements
4. Avoid unauthorized actions

Management objectives:

1. To preserve and protect the resource.
2. To protect the user, within the limits of public policy, from harm in connection with his use of the resource.
3. To provide, preserve, and enhance satisfying recreational opportunities.

Strategies to solve a problem:

1. Improvement of the ability of the resource to serve the desires of the public.

2. Making the resource more durable.
3. Shielding users from harm.
4. Controlling the way people behave.

People Control:

1. Regulation
2. Licensing
3. Manipulation of fees
4. Site design and delivery of service
5. Information and training

(GL Peterson, DW Lime 1979)

Other factors necessary to consider are:

1. Feasibility of alternatives. Each alternative must be practical, attainable and affordable.
2. Alternatives not feasible would need to be identified so it could be shown that the range of available alternatives was comprehensive. Sideboards set to portray that alternatives developed are the feasible ones.
3. Some required criteria to be used in evaluating alternatives are:
   A. Effects on consumers, civil rights minority groups and women. (Secretary's Memorandum 1662 Supplement 8, OMB Circular A-19, and FSM 1730).
   B. Effects on prime farmland, range land and forest land.
   C. Effects on wet lands and flood plains.
   D. Effects on threatened and endangered species.
   E. Effects on cultural resources.

4. Some criteria used if they have an effect are:
   a. physical factors
   b. biological factors
   c. economic factors
   d. social factors - See 1909.15 NEPA Procedures Handbook for components list.

The problem of protection analyzed in context of the foregoing principles presents a challenge. Preservation of a site can range from "locking up" to curation with definitive archeological interpretation.

Locking up a site or area has been attempted in the past and generally results in large expenditures of money with little effect in protecting an area. The large expenditures are questionable due to the apparent lack of public benefit and degradation often increases as a false sense of security exists leaving an area prey to the more unscrupulous users.

Curation is probably the best present day protection an area could receive. However this is not prefect as it is limited to presently known methods and techniques. This results in lost opportunity to use better and more improved methods not yet developed or tried. An even greater disadvantage is that curation is limited to present day manpower and dollar availability, both of which are very limited. These two extremes represent the presently known side boards of protection. The middle ground contains several methods that more nearly fit the managers budget and abilities. These are: signing, patrolling, developing an area in such a way as to improve protection and securing

assistance from historical societies and associations to provide improved protection. Any of the methods described could be viable if the significance of the area dictated.

With these in mind lets pose several questions to help identify as clear a picture of the resource, problem, opportunity as we can.

QUESTIONS TO CONSIDER IN SITE ANALYSIS

1. How does the site or area fit into the Regional context of similar sites? Also, what is the Regional context?
   a. Is it a duplicative type area?
   b. Is it unique and or essential to the full Regional system?
   c. Does it have special features that present extra opportunities for management?
2. What would be the objective s in developing this particular site?
   a. Would the site have opportunities to further managements objectives? (Protection, enhancement, providing for public use.)
   b. Would the site be limited to recreational enhancement?
   c. Is the site in need of further protection.
   d. How does this area help or hinder meeting forest goals of interpretation from the forest plan?
3. Would use, or increased use, create problems beyond the ability of the manager to solve?
   a. What type of facilities would be needed?
   b. Would the site require hardening to allow use.
   c. How would this contribute to the total multiple use of the

Ranger District? Would the development be an integral part or would it be a special operation? For example, are roads and parking facilities needed for other uses or are they specific to one use?

d. Is this an irreversible commitment of resources? Does the action taken remove, for all time, any of the resource? This is a particularly significant concern when dealing with cultural resources as they are non-renewable.

4. Would the development, interpretation, site modification and use be considered as having "No effect" on the cultural resource? The basic intent of the Laws, Rules and Regulation promulgated to protect cultural resources. (36CFR Part 800)

5. Can the use be managed safely?

To help further determine what kind of protection and if interpretation is appropriate the following Key establishes criteria to be used in weeding out sites or areas.

Key to Determine Protection or Interpretation Needs

1.	Site or area - unknown to public	>	Protection confidential record.
	known to public	V	
2.	Minor significance	>	Protection, signed as to legal sanction.
	Major significance	V	
3.	Unable to meet Forest objectives for interpretation	>	Protection, signed & patrolled.
	Able to meet one or more of Forest objectives	V	
4.	Forest objectives already met site or area not needed at present time	>	Protection, signed & patrolled.
	Forest objectives needed	V	
5.	Unable to develop Interpretive Plan through story level	>	Protection, signed & patrolled.
	Able to develop Interpretive Plan through story level	V	
6.	Unable to develop facility needs	>	Protection, signed & patrolled.
	Able to develop facility needs	V	
7.	Unfavorable cost benefit	>	Protection, signed & patrolled.
	Favorable cost benefit	V	
8.	Secure interpretive messages from professional interpreter	V	
9.	Prepare Environmental Analysis - unable to mitigate environmental concerns and reach a "no effect" decision	>	Protection, signed & patrolled.
	Able to mitigate environmental concerns and reach a "no effect" decision.	V	
10.	Secure funding or place on capital improvement plan.		

CHAPTER IV

The case study to apply the process to determine protection and/or interpretation needs will be Millstone Bluff Archeological Area.

In answering the questions posed in Chapter III, this investigator answered from his viewpoint and literature search on the area. Also, the Forest Archeologist was given a copy of the questions and his answers were solicited. It is an interesting note that "interpretation" to an archeologist is different in its meaning than to a land manager. Archeologists use interpretation to mean the explanation of findings within the context of archeology and not the revelation of the stories of the past to the people of today. Also, "significance" takes on new meaning when measured against two separate criteria. From the managers viewpoint, Regional significance meaning, is some story untold that is necessary in some way to be a part of the total picture. To an archeologist this means "are some answers to the history yet to be found and does the area perhaps contain this information."?

The proper approach to resolving these differences is to work closely with the archeological professionals and mesh the needs of the manager with the needs of the archeologist.

DESCRIPTION OF AREA

MILLSTONE KNOB

*Millstone Bluff rises 320 feet above the comparatively flat surrounding agricultural land. The top of the Bluff is egg shaped with the large end to the west. The top, about 3 acres in size, is covered with a thick layer of leaves and mulch, is densely wooded and rimmed with low cliffs. On the south and southeast aspects access to the top is through narrow crevasses in the rimrock. Situated a little west of center, at the top of the Bluff, is a flat area (about 100' in diameter), obviously a Village Plaza. Surrounding this plaza in more or less regular fashion there are 8 house depressions, each about 12 feet in diameter. At least 9 other depressions occur randomly near the Village site.

Northeast of, but very near, the Village site is an extensive burial area. Approximately 50 rocklined crypts remain. The crypts were originally rock capped. Most, if not all, of the graves have been looted.

The low cliffs previously mentioned are cut by several major crevasses. Where these crevasses could have provided prehistoric access, it is clear attempts were made to wall in the Bluff. There is evidence of the existence of several stonewalls on the Bluff. The obvious conclusion is that the village site was fortified.

Petroglyphs resembling a bears paw, an eagle with spread wings, peace

pipes, a cross with a circle and what appears to be a map occur on bench rock located at the western periphery of the Bluff top.

*Description in part from Lowell A. Dearingers article, "Millstone Knob" which appeared in the July, 1963 issue of Outdoor Illinois.

STATEMENT OF SIGNIFICANCE

Millstone Bluff is undisturbed by plowing or other destructive activities, it is one of the very few undisturbed prehistoric sites in the Eastern North America's. Most other similar prehistoric sites in the area have had their surfaces altered.

As previously mentioned, this site has sections of prehistoric stone wall standing in various places. Stone walled sites in the Eastern United States are generally an archeological mystery; however, we have good cultural associations at Millstone Bluff.

There is a well defined cemetery precinct at the site. While some of the graves have been looted, there is a strong possibility that unlooted graves are to be found; unlooted stone box graves are a rarity in Eastern North America.

Several visible circular house depressions are situated around a central "plaza" area, again undisturbed. These are most probably of a Mississippian (1000-1560 AD) affiliation.

Numerous petroglyphs (rock carvings) are present including birds, mandellas, male and female human stick figures, and other geometrical motifs. Petroglyphs associated with a habitation site are extremely rare, let alone an undisturbed site.

Several Mississippian and late Woodland (Lewis Focus) pottery shreds have been recovered from the surface of the site. On the basis of 1972 excavations the Southern Illinois University Museum has determined that stone "forts" were occupied in late Woodland times (600-1000 AD) in Southern Illinois.

Millstone Bluff is a unique, undisturbed, prehistoric site, because of its excellent preservation, and types of cultural features present. Although not yet excavated, it is worthy of nomination to the National Register on the bases of surface evidence alone.

Significance Statement Prepared by:

Frank Rackerby
Curator of North American Archeology
University Museum, Southern Illinois
University at Carbondale

So states the two documents that placed Millstone Knob on the National Register of Historic places October 15, 1973.

With very little left to add, the previous excerpts succirctly describe the prehistoric Millstone Knob Archeological area. A mention should be made of the hard sandstone cap rock material being used to produce millstones for local grist mills during the historic settlement period; hence, the name Millstone Bluff. Also a limestone quarry existed for many years at the base of the Bluff and limestone was quarried for agricultural and road construction use.

This quarry said to be the first limestone used in agricultural experiments, to improve soil productivity, at the old Soil Conservation Service Erosion Control Project, now the Dixon Springs Agricultural Research Center administered by the University of Illinois, under special use permit from the Forest Service.

Application of questions to apply to alternative development, focused onto one specific site.

1. HOW DOES THE SITE FIT INTO THE REGIONAL CONTEXT OF SIMILAR SITES? See Cahokia Mounds State Historical Site brochure - 50M-5-78.

   Obviously this site, just from the establishment reports, is intimately connected into a much larger regional situation. This particular site appears to also represent a Late Woodland site later taken over or occupied by the much more advanced culture we know as the Mississippians. What can we confer from this established connection? One, that we would not need to duplicate any efforts already being extended in the development of these two cultural periods. If no other agency was working on this particular culture, then it would seem to be a viable alternative for interpretation at this location. However, the effort being expended by the State of Illinios at Cahokia Mounds would be difficult to duplicate, therefore, it is determined, that until such time as this site is needed to portray some aspect of the Mississippian culture not found elsewhere, it is not significant for interpretation as part of the greater Regional program. The Woodland culture aspects of Millstone may

prove to be valuable in the future, but at the present time stone forts are included in Nature Preserves (Indian Kitchen) and other areas and are not considered really unique features. (Brieschke, W.J. and Racherby F., 1973.) Much work remains to be done on the whys and wherefores of stone forts and in the future Millstone Knob may play a part in unraveling that particular mystery.

The answers to subpart questions are:

A. IS IT A DUPLICATE AREA?

Yes, several other areas represent the same type of resource. It does need to be recognized that there are certain quality aspects to Millstone Knob not generally found at other sites. The area has not been plowed. The area represents an area occupied by both Woodland and Mississippian people.

B. IS IT UNIQUE AND/OR ESSENTIAL TO THE REGIONAL SYSTEM?

No, Millstone is but one of many sites found in the Regional area. Kincaid Mounds in Massac County south of Millstone Knob is a series of earthen mounds part of the greater Mississippian system totally devoid of any development at this time.

C. DOES THE SITE HAVE SPECIAL FEATURES THAT PRESENT EXTRA OPPORTUNITIES FOR MANAGEMENT?

Yes, Millstone has a rather distinct village site with adjacent burial ground severely looted. This, in reality, represents all that's bad about indiscriminate collecting and boldly portrays, as a bad example, what should not occur.

2. WHAT WOULD BE THE OBJECTIVES IN DEVELOPING THIS PARTICULAR SITE?

The first objective that is obvious is that of protecting this resource. The District has spent increasing amounts of money and manpower to stop the pilfering that goes on. The area was progressively excluded from the public use. The road into the quarry was closed and an entry by 'permit only' closure was enforced. The legitimate use dropped down and as far as this investigator can determine, the illegitimate use continued. Some people were caught and fined for illegal actions but not very many. Patrols were made into the area and a hidden camera was used one spring to detect unauthorized diggers. The task of securing a large tract of land surrounded by private property with limited resources presents an almost impossible task. Last year the road closure was removed, the permit requirement dropped and warning signs explaining the legal sanctions available were posted. For one year no further disturbance has occurred in the area. One year of monitoring is insufficient time to prove that an increase in users will actually deter illegal actions.

The secondary objective apparent to this investigator would be the excellent opportunity to use this site for public education in what not to do. Here the obvious destruction of the cemetery represents a first hand way of bringing home to the user just how unacceptable this behavior is. It is one thing to talk of picking up arrowheads in a field and quite another to dig up your "grandmothers grave". A third objective available for this area would be the enhancement of a recreational experience. With a

little interpretation, the minds of the users could be made aware of the extensive prehistoric use of the area and exposed to the mystery of Millstone Knob and the Mississippians in general.

A. WOULD THE SITE HAVE OPPORTUNITIES TO FURTHER MANAGEMENT OBJECTIVES?

Yes, protection through increased use of an acceptable kind, believed to reduce unacceptable use. Also to provide a recreational opportunity.

B. WOULD THE SITE BE LIMITED TO RECREATIONAL ENHANCEMENT?

No, a multiplicity of objectives could be met. An opportunity to capture several stated objectives exist in this one local. i.e., protection, public education, recreation enhancement.

C. IS THE SITE IN NEED OF FURTHER PROTECTION?

Yes, obviously the efforts of the past leave an unfulfilled need that could be addressed in a development. No requester of a permit was ever denied access into the area but no structuring or enhancement was ever instituted leaving a gap in the protection and interpretation of the area. Increased use is visualized as needing to be channeled along a path or trail. This would concentrate the use on a smaller portion of the area and should result in increased protection for

the remainder of the area. The trail would insure that visitors were able to find the significant features and not have to scramble all over the total area.

D. DOES THIS AREA HELP OR HINDER IN MEETING FOREST GOALS OF INTERPRETATION FROM THE FOREST PLAN?

The apparent helpfulness of this area in fostering public education, with the expected increased awareness to result in better protection, will place it high on the priority for development.

E. WOULD THE SITE HAVE TO BE HARDENED TO ALLOW USE?

This is a tough question to evaluate but by concentrating the use on a small area and then protecting that area by hardening, if necessary, should prove to be a beneficial effort. If most all use was on a trail through the area, then surfacing the trail could be a need and should produce no damage to the resource. Some work with a soil scientist might show the level of activity (people per day) that could use a trail unsurfaced (for a specific soil type) and consequently predict at what use level surfacing would need to be applied. A note to keep in mind is that surfacing material by its very nature could effect an archeological area by introducing foreign material into the area. The selection of materials carried into an area would need to be carefully coordinated with the archeologist.

3. WOULD INCREASED USE CREATE PRORLEMS BEYOND THE ABILITY OF THE MANAGER TO SOLVE?

For Millstone, this investigator would say, no. The options of retreating to other less desirable strategies would always be available. No user was ever denied permission to enter the area and the use level, while expected to increase, is not expected to become unmanageable. On a busy weekend at Lake Glendale an offer was made to the campers to conduct a guided tour of Millstone Knob and 10 people showed up.

This might be expected to increase in time, but no overwhelming rush to view the area is anticipated. An average of 20 permits a year with an average of 10 people per permit over the last 14 years gives one an idea as to the expected level of usage. Reviewing the five items of people control it can be seen that, "Regulation" would be one area that would be used. The present regulations against destroying an archeological area would remain in effect and be enforced. There appears to be no opportunity at present to "license" someone to run this facility. There is no active local historical society available to run an area like this. There would be no "fee" at the present time. However, if in the future, a fee were imposed, then manipulation could be used to space out and regulate the intensity of the use. The area of "site design and delivery of services" would be the most important in protecting and enhancing this site. Also "Information and Training" would be one of the basic objectives used to solicit future responsible actions toward cultural features.

A. WHAT TYPE OF FACILITIES WOULD BE NEEDED?

1. Access. Road and parking area (already existing at Millstone Knob, Old Quarry road and borrow pit). (10 cars design.) (2.5 people/car @ 10 cars/day.)

2. Trail. Partially existing, in reality many more than is needed, elimination or non use would be desirable on most of the present systems. Trail designed to show features of area efficiently with little wasted motion.

3. Interpretive signing. At major features an explanation of what has occurred to create the condition or an arousal of curiosity as to what occurred and why.

4. Brochure or Phamplet - going into greater detail or tieing the whole Regional scheme together. This could be an element of the Recreation Opportunity Guide. An enlarged story could be told to tie together all the past history of the local and regional area.

B. HOW WOULD THIS CONTRIBUTE TO THE MULTIPLE USE OF THE RANGER DISTRICT?

The road and parking facilities would be useful in the multiple use of the surrounding area. The access road would permit forest users to hunt, hike and gather firewood that is an integral part of the Forest. The interpretive trail would satisfy both a short hike and an interpretive facility at the same time.

C. IS THIS AN IRREVERSIBLE COMMITMENT OF RESOURCES?

This is a question to be answered in part by an archeologist and in part by a manager. A trail could or could not depending on construction technique be an irreversible committment. Curation of the area under the trail could save the information and resolve a problem. Also filling the surfacing over the land would leave the actual site undisturbed. Based on trail location and amount of disturbance anticipated this investigator predicts no damage to the resource from trail creation in this area. The bulk of heavy soil movement to create a trail lies outside the top of the Knob and preliminary review indicate no expectations of problems.

It can be seen from the application of basic principles and evaluation as to opportunities, issues and concerns that one can develop a clear picture of an individual site. This will allow the development of a series of strategies that can answer to the needs of both the manager and the user.

INTERPRETIVE PLANNING

Running down through the Key to determine if the area qualifies for Protection or Interpretation it becomes obvious that Millstone Bluff would qualify for Interpretation. See Appendix 5. The Interpretive Plan, Appendix 10, was developed to provide an example and to determine how far the Land Manager might be expected to go before specialist

help was needed. Without each manager becoming a professional interpreter it was determined that ordinarily the interpretive plan can be developed up through the story level. The final messages need to be developed by someone with experience and expertise in interpretation.

CHAPTER V

INTRODUCTION

How to protect cultural resources have always plagued mankind. Attempts to protect these resources can take many directions. The history of the land unrecorded lies buried, only to be discovered, through carefull study, by professionally trained investigators. This particular concern is doubly compounded by both the desire of people to enjoy the remnants and the desire of these or other people to own the artifacts that are the very keys to unlock the stories of the past.

This conflicting use of a resource presents the manager with an apparent dual role of protecting and interpreting for the public benefit.

To clearly define strategies to achieve these objectives a study of the area and its relationship to the larger story is essential. Through a clear understanding of the importance of the area, management objectives can be focused on more specific issues within the broad context.

Through inventorying the features of the site, opportunities to further managements basic objectives can be identified. Managements responsibilities are to conserve funds, respect constitutional rights, comply with due process requirements, and avoid unauthorized actions.

The managers basic objectives of preserving and protecting the user, and to provide, preserve and enhance the recreational opportunity, directs the nature of any actions taken.

Through the identity of problems already existing or expected, suitable strategies can be involved in the management of the areas. These strategies for problem solution generally follow four types. The improvement of the ability of the resource to serve the desires of the public. The making of the resource more durable. The shielding of the users from harm. The controlling of the way people behave. The first three strategies are basically single purpose and can be produced through engineering and design.

Controlling peoples behavior however is a more complex issue. Several methods can be used to influence the way recreation users behave. They are: Regulation, Licensing, Manipulation of Fees, Site Design and Delivery of Services, and Information and Training. (Peterson G.L. & Lime D.W., 1979).

Using these principles in evaluating each aspect of a particular area, reduces the problems to a manageable level. Any problem no matter how complex lends itself to solution if it can be subdivided into its smallest components. The application of either economics or achievement of objectives allows one to select components of a management action that can solve the problem.

Summary of Procedures and Findings

The answer to what you will do and how much investment is worthy can only come from a fairly comprehensive study of an individual area. The application of specific questions can help clarify the opportunities and problems present within a given resource. This allows selection of management objectives for the area. By comparing investment with expected results an understanding of the merits for the development can be displayed. In this study a case can be made for additional investment over past protection measures to accomplish several objectives at one time.

The procedures used in this study of breaking the overall ideas into seperate components and analyzing them from both feasibility and objective accomplishment allows the development of actions that will meet the intent of the law.

The need to work with the specialists (i.e., archeologist, soil scientist, and interpretist) cannot be over emphasized. Bringing their special knowledge to bear on each element can resolve a lot of confusion about what is truely needed to accomplish the objectives.

With this process an understanding of the value of the particular resource and the cost of striving to accomplish the stated objectives can be compared to the expected benefits from the investment. This will allow the manager to assign priorities to his budget requests for this particular resource. This will also help answer the concern of economic analysis to justify the investment of public monies.

Conclusions

Based upon the findings and within the limitations of this study it is concluded that identifying objectives and devloping actions for a specific archeological site can be systematically done. With the assistance of selected specialists a manager can present a rational plan for the Protection and or Interpretation of the area entrusted to his care. While the interpretation may present a colorful opportunity, it can be seen that the measure of objective accomplishment is the underlying motivation for the expenditures.

That interpretation of Millstone Bluff will increase the Protection of that area is a conclusion arrived at through this study.

Implications

Some difficulty will always occur when one has to deal with relative costs instead of actual costs. This should work out over several projects.

The true accomplishments to be measured are how well the recreational experience was improved and how well the area has been protected. Statistics for several years will need to be accumulated before a definitive answer can be determined.

Also the assumptions as to use and ability of the soil to withstand compaction will need to be measured. Very few measurements have ever been taken on compaction and this area should be further analyzed and included in future projects.

Through the use of various analysis techniques it can be seen that complex problems can be made manageable. For many years several ideas of what to do with Millstone Bluff have been kicked around. Expenditure expectations ranged up to $100,000. From a purely economical basis, expenditure of that nature would require such a use rate that the quality of the recreational experience would be highly questionable. Also the probability of achieving such a use rate is unlikely. From the present analysis a comparison of management needs to expected expenditures appears to represent a level that can be supported during times of budget and manpower constrains. In reality a larger investment, unless it produces a much greater return in use and experience, would be impossible to justify.

This particular area, Millstone Bluff, represents a good opportunity for interpretation. The problems of protection without interpretation on many of the lesser sites will eventually surface. From past experience at Millstone and a few other minor sites, it appears that signing with appropriate signs goes a long way in detering inappropriate activities. From all indications, once a site is known, if you do not post signs and patrol for a period of time, deteriation will continue. However, after it becomes established that the area is protected, illegal activities decline. This particular hypothese needs further testing to see if in fact activity is reduced or just displaced.

The past management of most all of the cultural areas have been on a negative restric ive basis. It is time for positive management to

be fostered and steps taken to change the undesirable conditions that exist at the very root of the problem. Public education and support will go a long way toward reducing damages and costs that are so much a way of life for present managers.

Recommendations

There remains to be completed the Interpretive Plan and the medium selected to display the interpretation. The project proposal and cost computation can then be finalized. With the project plan well developed it is expected that support for the actual funding will be forthcoming. With the interpretation in place the District Ranger will need to keep track of the project to determine if the desired effect was achieved. Using interpretation to accomplish management objectives other than enhancement is expected to become an increasing role for the manager. Successes and failures are bound to occur. The need to keep records and evaluate feedback will be an important part of the total process.

The recommendation for Millstone Bluff is to proceed with all possible speed to achieve the plan and objectives set forth for the area.

The recommendation for the process and procedure is to apply it to other areas and see what the results will be, also see if other managers will find the procedure helpful.

Appendix 1

Discussion of and relative cost development for different media.

A case needs to be made for the use of relative costs when actual cost are unattainable in alternative assessment.

A real surprise confronted this investigator when actual costs per either square foot of sign or by letter was unattainable.

All commercial producers and even governmental agencies were found not to keep statistics on actual cost of projects previously completed. The nearest figures to productions cost came from Federal Prison Industries who is currently working on pricing guides for non standard signs. Their current policy still requires you to submit your layout and artwork to receive a price quote.

With this serious handicap in mind an understanding that if the relationship of costs between different media is known, a valid comparison can still be made between alternatives. To develope each presentation to the finished stage and secure a price quote would be unrealistic in the early planning stage. There is one variable that occurs to this investigator that will be hard to adjust between the media.

The different media display, by types of messages and wordyness, and types of art work, a different reaction to cost. For example panels produced through a silk screen or photo process are not as sensitive to wordyness as are routed wood or sandblasted stone messages in cost of production. Also art work in photo and silkscreen processes is much easier to produce then by hand in wood or stone.

Here is where objectives set for the area and type of presentation may become one of the criteria used to weed out the lesser preferred alternatives. This also has the possiblity of establishing one of the side boards on the alternative developement.

In the media selected some differences occur that tends to group them. For example wood and stone would have comparable compatibilities for art types and wording. Also figerglass embedment and metal photo will be together in capability.

The types of messages and art presented in the wood and stone media would of necessity be simplistic and laminated plastic and metal photo could almost approach photographic quality of presentation. Fiberglass embedment is well adapted to color while metal photo has only limited variation.

Based upon objectives and style for the area both metal photo and laminated plastic can be made comparable in appearance and cost. This same standard exists for wood and stone, but the presentation would of neccesity be of a less complex nature.

Cost Estimate for Interpretive signs:

	Wood	Metal Photo	Fiberglass Embed.	Stone	Pamphlet
Material	3000	4125	3350	3600	$1000
Construction	350	350	350	385	750
Maintenance	($250/yr)	(100/yr)	(100/yr)	(100/yr)	$896/yr
Present Net Worth = 7.0243 x Cost	1756	702	702	702	6293
TOTAL	5106	5177	4402	4687	8043

Present Net Worth - using $Po = b\left[1 - \frac{1}{(1+r)^n}\right]$

Electronic and phamplet presentations will be dropped from further consideration as not feasible. This represents the upper side board on these particular alternatives. A discussion of relative merits of each remaining media follows.

Wood - Relatively cheap to produce, limited in adaptability to art and expensive to maintain. Does have the ability to meet objectives of low profile and low contrast for this particular area.

Stone - More expensive to reproduce but cheaper to maintain. Has same limitations as wood for art reproduction. In a stone laden environment would represent high degree of compatibility.

Metal Photo - Costs of production comparable to wood. The costs savings from the use of this process come from producing many copies of the same sign. In interpretive work this is not an advantage. Metal photo signs generally come in two styles - silver background with black letters or brown or black background with silver letters. Experience shows black letters on silver background receives the least amount of vandalism. The limitation on colors would rank this medium as less desirable because of difficulty in meeting low contrast standard for the area. To use the low contrast style would increase the vandalism factor.

Fiberglass Embedment - Potentially a cheaper method than any of the other media. Has distinct advantage of using color to produce low contrast signing with excellent flexibility in art work. Has vandalism potential above stone and it may be higher than metal photo. This medium would rank highest where colors would be essential to the messages conveyed.

All four of these media would have to be considered as comparable. From the relative costs and compatibilities for interpretation Stone and Fiberglass Embedment appear to be slightly better. To distinguish between these two may require an anlysis of which presents the best public image and does the best job of presenting the message. This analysis will need to await the completion of the Interpretive plan. With a more fully worked out plan the messages and appropriate art work can then be matched to the best medium.

Wood Signs

Millstone (cost estimate)

52 letters @ 1.15/letter =		59.80
2'x3' sign @ 18/sq ft =		108.00
Art work =		50.00
Stain and letter painting =		20.00
		237.80
	Round to:	$250.00

Stone Wall

estimated to be the same as above =		$250.00
Petroglyphs		$250.00
Thunderbird, Maps, Sun wheel =		$250.00
Cemetary		$250.00
Village		$500.00
	Signs	1750.00
	Posts and Mounting	150.00
		$1900.00
History sign and post and base		600.00
Interpretive Theme sign and post and base		600.00
Bulletin Board (Regs, etc.)		250.00
		$3350.00

Signs last 10 years

Maintenance every year (10 times)$250/yr	$1756.00
Present Net Worth	$5106.00

Stone Monuments

In a search for vandal proof media one needs to consider all presently used applications. (R-8 Improvement Suggestion R-8Ch/0-11-82)

From talking to the local (grave marker) monument dealer the viability of using local sandstone and producing signs for Millstone definitely seems possible. The local plant has a size limit on stones as follows:

No longer than 6 foot

No thicker than 1 foot

No wider than 3 foot 2 inches.

Surface relatively smooth so template would lay flat.

An offer has been made by local plant manager to produce free one stone on selected sandstone blank to see how well the stone would perform as a medium. Until interpretive stories could be developed and any attendant art work produced an estimate will not be attainable, As in about all other medias investigated. However an estimate of about 20% increase in cost is expected over wood signs. An increase in installation costs would be expected estimated to be 10%. However, practically no maintenance cost would be anticipated.

1.20% x 3000 costs of wood signs	=	$3600
1.10% x 350 construction	=	385
$100/yr maintenance	=	702
Present net worth		$4687

Metal Photo

Maintenance 10 year expectancy

Maybe light auto waxing every year - could be done while patrolling area.

If plates not vandalized, guaranteed 20 years against fading.

Plates .20 thick - mounted to posts or onto back boards roughly @	375
5 signs @ $375 ea	1875
3 signs @ 2 x $375	2250
	4125
Posts and Back boards	350
	4475
Maintenance 100/yr/10 yrs	702
Present net worth	$5177

Fiberglass Embedment

Costs per sign same for layout and art work developement. No maintenance for 10 year period on panels.

Signs generally more vandel resistant and more contemporary. Information is that any individual sign may be cheaper made this way than wood routing. Would need mountings etc. to place panels and signs on. This would place this system comparable to wood routed signs in total cost.

The advantages are:

1. contemporary
2. Color and art work easily added
3. Low use of manpower after installation

Generally in interpretive work this would more nearly approach state of the art.

Cost estimate	$3350
Construction	350
Maintenance costs $100/yr/10yrs	702
Present net worth	$4402

Electronic transmission with interpretive story covering close in area around Knob.

Could expand message and add sound effects for the different stories.

Disadvantages are each group or individual would need portable radio as no provisions could be made for head set distribution and retrieval. Unless synchronized to each interpretive feature difficulty in getting good story across would be encountered.

Cost estimate from R.O. Interpretive Services on Radio System on Highway

Cost $7000

Phamplet With Numbered Stations

Based on a one color, 5½ x 11 three fold phamplet the cost are estimated to be:

Developement	$500
10,000 copies	500
# posts	150
Display and Sign	600
	$1750
Maintenance *@ $896/yr	
Present Net Worth	$6293
	$8043

*=Maintenance at ½ manday per week for 7 months of the year = 14 mandays/year at $64.00/day = $896/year discounted at same rate as other examples = $6293.

The high salary rate would come from the person normally available to do this type of work. A better way might be to contract or find a volunteer. This would reduce the cost.

Experience in the Forest Service generally shows this system as less desirable in a National Forest context. The general extensive management employed on forests will often leave the phamplets in short supply and the litter unpoliced. Because of these factors this system will be dropped from further consideration. However, this idea could be employed in the Recreation Opportunity guide at the District office. Further attention to history and stories of Millstone would be expanded as typewritten pages would be cheap to produce and only given out by request.

Site or Area Questionnaire

1. How does the site or area fit into the Regional context of similar sites? Also what is the Regional context of the site?

   A. Is it a duplicative area?

   B. Is it unique and/or essential to the full Regional system?

   C. Does it have special features that represent extra opportunities for management?

2. What would be the objectives in developing this particular site?

   A. Would the site have opportunities to further Managements objectives? (Protection, enhancement, providing for public use.)

   B. Would the site be limited to recreation enhancement?

   C. Is the site in need of further protection?

D. How does this area help or hinder meeting forest goals of interpretation from the Forest Plan?

3. Would use, or increased use, create problems beyond the ability of the manager to solve?

A. What type of facilities would be needed?

B. Would the site require hardening to allow use.

C. How would this contribute to the multiple use of the district use? Would the developement be an integral part of the District or would it be a specific project with a single purpose? For example, are roads and parking facilities needed for other uses or just for this project?

D. Is this an irreversible commitment of resources? Does the action taken remove, for all time, any of the resource? This is a particularly significant concern when dealing with cultural resources as they are non-renewable.

4. Would the proposed development, interpretation, site modification, and subsequent use be considered as having "No Effect" on the Cultural Resource? This is the basic intent of the Laws, Rules, and Regulations promulgated to protect cultural resources (36 CFR Part 800).

5. Can the use be managed safely? Will the user be exposed to above average risk of injury?

Protection - this would mean signing with information that the site was protected under federal statute and patrols checking on the area when it would be most likely to deter illegal activity.

Interpretation - providing for public use with some way of informing the visitor of what he was viewing.

Soil Legend

340 - Zanesville . . . . .

301 - Grantsburg . . . . .

598F2 - Bedford 3d2

955G - Muskingum-Berks . .

691G - Beasley 3r3

339 - Wellston . . . . . .

691 E&F - Beasley. 2r2

382 - Belknap. 204

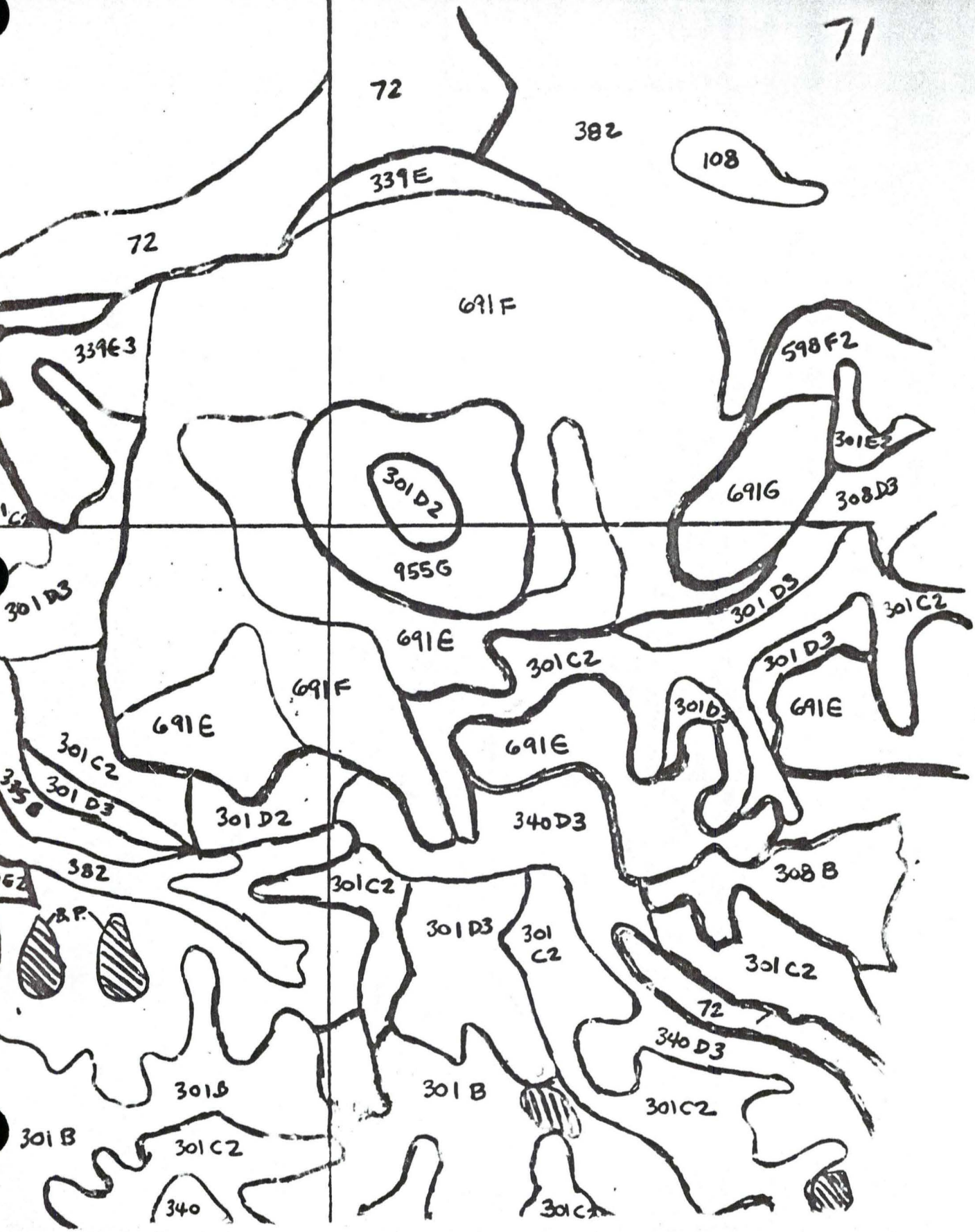
108 Bonnie 2w5

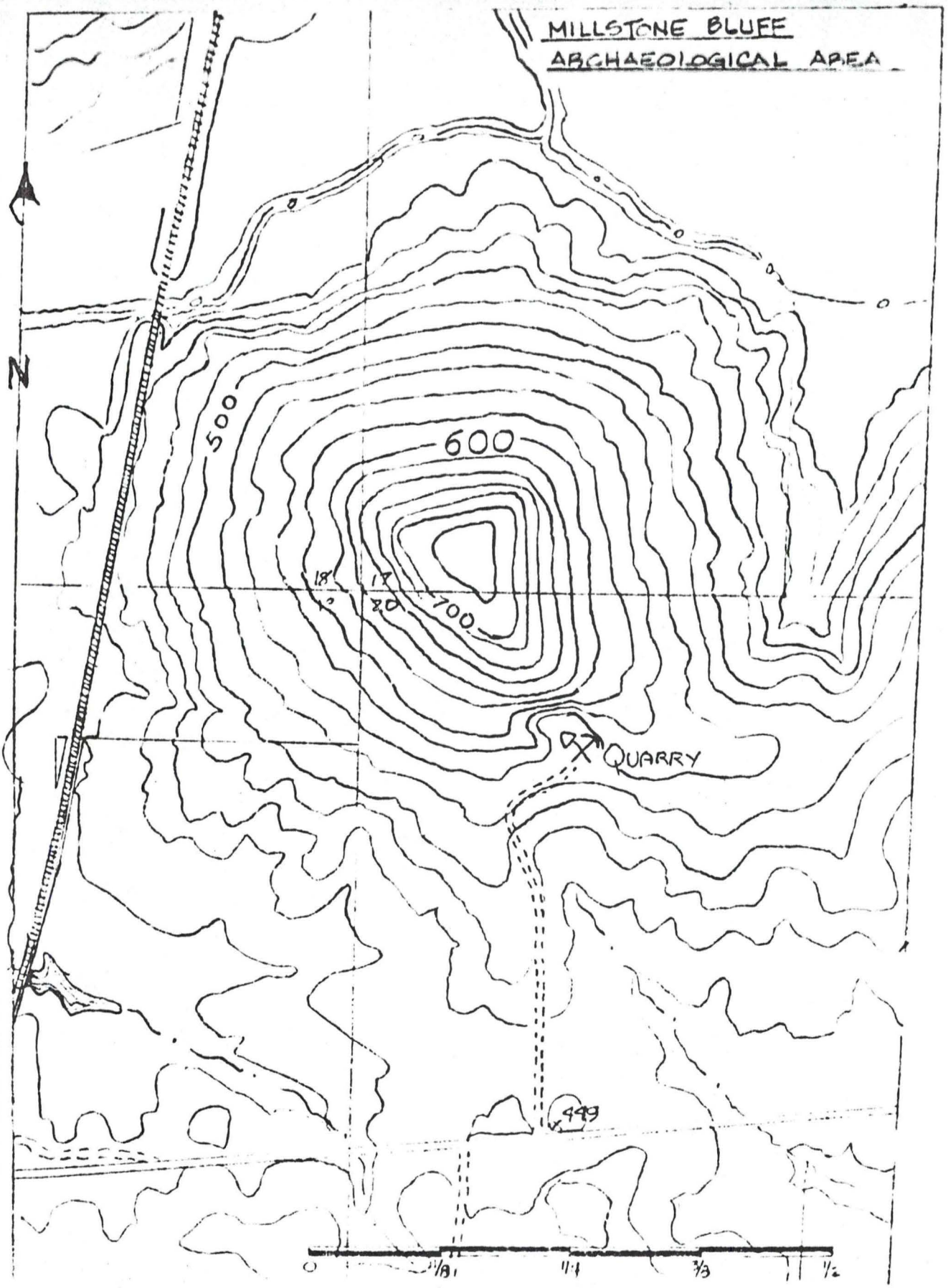
335B - Robbs 301

308D3 - Alford 101

APPENDIX "3"

HISTORIC AND ARCHAEOLOGICAL AREA




MILLSTONE BLUFF
ARCHAEOLOGICAL AREA
N
500
600
700
18
17
20
QUARRY
449
0
1/8
1/4
3/8
1/2

18
17
16
19
20
21
Hobbs
Glendale
Hayes
Creek
Bell
Central
Allison
301C2
301D3
340D3
340E3
301D2
340E2
301B
691E
691F
335B
339E
339F
382
72

APPENDIX #4

People and organizations contacted for information on sign media and costs.

1. Craig Whitney
   Regional Interpreter
   Milwaukee, WS
   Ph: (414) 291-3693

2. Jim Schleyer
   USDA Design
   Washington D.C.
   Ph: (202)447-4337

3. John Shoaf
   National Park Service
   Denver Service Dept.
   Electronic Engineer
   Ph: FTS 234-2486

4. Fred Jessen (Interpretive Planning)
   National Park Service
   Harpers Ferry, WV
   Ph: 925-6308

5. Metal Photo Corp./Finish Product Dept.
   18531 South Mile Rd.
   Cleveland, OH 44128

6. Federal Prison Industries
   Washington Sign Coordinator
   Ph: (202) 724-6312

7. J. W. Reynolds Monument Co.
   Vienna, IL 62995

8. Permaloy (Ron Walker)
   Etched Alum. Process
   Utah
   Ph: (801) 782-3700

9. Ray Price (Outdoor Exhibits)
   National Park Service
   Martinsburg, WV
   Ph: (304) 535-6371 ext. 6577

10. Watco Identification
    Fiberglass Embedment
    Ph: (615) 684-3555

APPENDIX #5

Answers to the Protection and or Interpretation Key for Millstone Bluff

1. Well known area
2. Major significance
3. Able to meet 3 objectives
   a. education and enjoyment of the public
   b. protection of the site
   c. enlist public support for protecting cultural resources.
4. These objectives are needed
5. Able to develope Interpretive Plan through story level
6. Able to develope facility needs
7. Favorable cost beefit ratio
8. Yet to be done
9. Yet to be done (In process)
10. Depending on answers to 8 and 9 above.

Key to Determine Whether Protection or Interpretation is Appropriate

1.	Site or area - unknown to public	>	Protection confidential record.
	known to public	V	
2.	Minor significance	>	Protection, signed as to legal sanction.
	Major significance	V	
3.	Unable to meet Forest objectives for interpretation	>	Protection, signed & patrolled.
	Able to meet one or more of Forest objectives	V	
4.	Forest objectives already met site or area not needed at present time	>	Protection, signed & patrolled.
	Forest objectives needed	V	
5.	Unable to develope Interpretive Plan through story level	>	Protection, signed & patrolled.
	Able to develope Interpretive Plan through story level	V	
6.	Unable to develope facility needs	>	Protection, signed & patrolled.
	Able to develope facility needs	V	
7.	Unfavorable cost benefit	>	Protection, signed & patrolled.
	Favorable cost benefit	V	
8.	Secure interpretive messages from professional interpreter	V	
9.	Prepare Environmental Analysis - unable to mitigate environmental concerns and reach a "no effect" decision	>	Protection, signed & patrolled.
	Able to mitigate environmental concerns and reach a "no effect" decision.	V	
10.	Secure funding or place on capital improvement plan.		

cahokia mounds

THE SITE

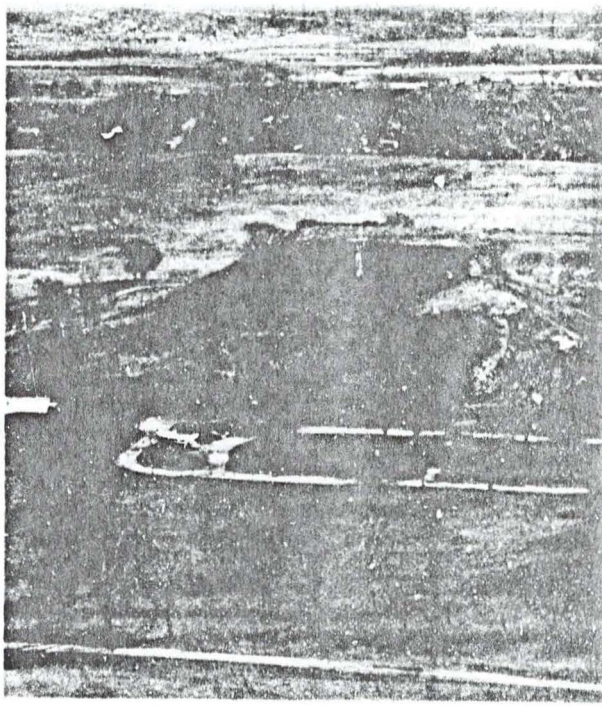
Cahokia Mounds State Historic Site preserves the remains of the central section of the only prehistoric Indian city north of Mexico. The actual name of this city is unknown, for it had been abandoned by its original inhabitants about three centuries before European contact. The name Cahokia derives from the Cahokia Indians of the Illini nation who were later immigrants to this area, arriving shortly before the French in the late 1600's.

The 960-acre state site a few miles northeast of East St. Louis, Illinois, and west of Collinsville, Illinois, is under the management of the Illinois Department of Conservation. Archaeological excavations have been financed by the Department of Conservation, the National Science Foundation, and various universities and museums.

HISTORY

Indian Cultures: According to archaeological finds, the Cahokia site was first inhabited around 700 A.D. by prehistoric Indians of the late Woodland Culture. Living in compact villages, they hunted, fished, gathered wild food plants and cultivated gardens.

Around 850 to 900 A.D. there emerged another group called the Mississippians. ("Woodland" and "Mississippian" are names assigned by archaeologists to describe these cultures; they are not tribal names. The Mississippians were so named because their culture was first discovered along the Mississippi River between St.

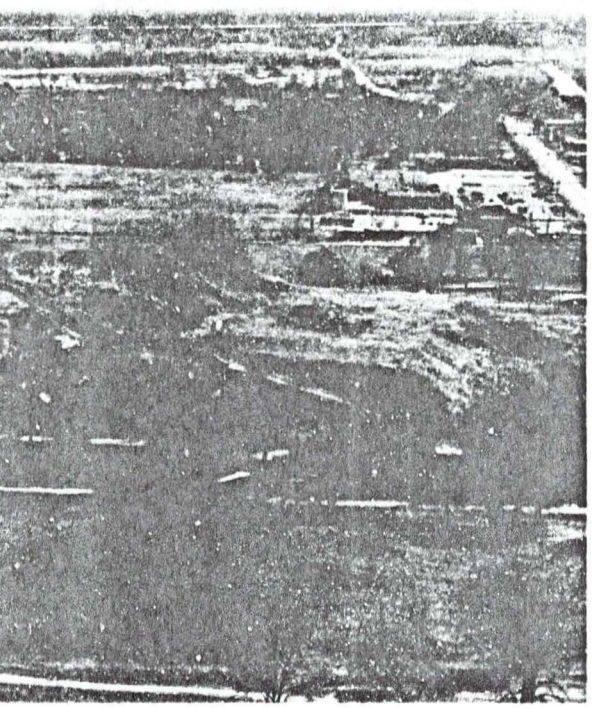


Aerial view looking east toward Monks Mound, New World

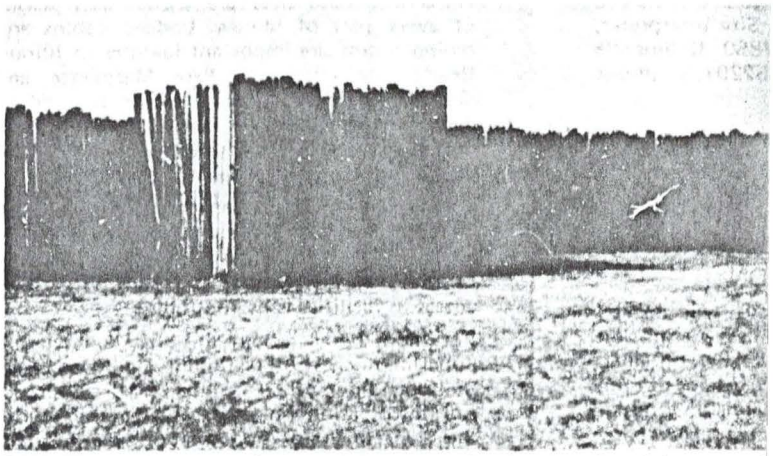
Louis and Memphis.) These people were dependent on a well-developed agricultural system with corn, beans and squash as the principal cultivated crops. This stable food base, combined with hunting and fishing, enabled them to develop a very complex community with a highly specialized social, political and religious organization. This life style eventually became dominant and what is now known as the Cahokia site became a regional center for the Mississippian culture. There were satellite communities near the modern towns of Mitchell, Dupo, Lebanon and East St. Louis, Illinois, and St. Louis, Missouri.

City of Cahokia: The city of Cahokia covered about 6 square miles and had a population of tens of thousands. As Cahokia was primarily an urban area, the residential section was quite extensive. Houses were arranged along what appears to have been streets or around open plazas. The main agricultural fields were probably outside the city, but small garden plots were probably found in the residential areas.

About 1150 A.D., a 12-to-15-foot high defensive stockade was built enclosing about 300 acres of the central city. Evidence shows that at least three more walls were erected in the same general location, the last constructed about 1300 A.D. It is estimated that approximately 15,000 logs were used for each construction. The second wall has been partially reconstructed on the grounds east of Monks Mound.



New World's largest prehistoric earthen structure.



Reconstructed version of the second stockade which enclosed the central

THE MOUNDS

Originally there were over 100 mounds, but many were destroyed by cultivation before the numbering system was begun in 1871. The location of only 87 has been recorded. Of this number, 20 have been significantly altered or destroyed by modern farming methods and urban construction. About 40 mounds are presently preserved in the historic site; the rest are privately owned.

The mounds are entirely earthen. The soil was broken up with digging tools made of wood, shell or stone and transported in woven baskets to the construction site. Most mounds show evidence of several construction stages. The digging left large depressions called borrow pits, which can still be seen in the area. It is estimated that nearly 50 million cubic feet of earth was moved by the Indians for mound construction alone.

The mounds were for ceremonial activities of the living; only a few of them were used for burial purposes. The type of mound characterizing the Mississippian Period and most common at Cahokia is the platform mound. This type of mound was square or rectangular with sloping sides and a flat top which served as a base for buildings used for ceremonial and religious purposes or for residences of rulers or priests.

Monks Mound: The great platform mound at Cahokia, Monks Mound, is the largest Indian mound north of Mexico and also the largest prehistoric earthen construction in the New World. Its base covers 14 acres, and it rises in four terraces to a height of 100 feet. On the fourth or highest terrace once stood a massive building at least 105 feet long, 48 feet wide and about 50 feet high.

Two other types of mounds, conical and ridge-top, are found at Cahokia. The exact function of these mounds is not known, but both may have been used for burial purposes.

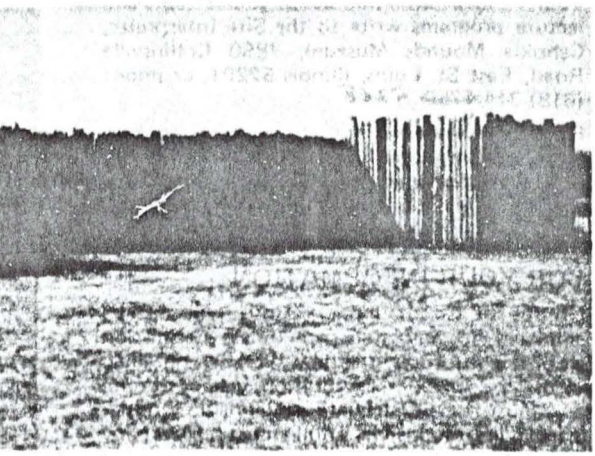
Mound 72: E
mound, Mound
monial and sac
in mass graves,
a ruler, a male
a blanket or ca
marine shell d
by attendants v
in the next wor
two copper tu
stones (discoid
load of mica a
various parts o
of this mound
with their ha
them, in the
skeletons of 5
ages of 15 and

WOODHENG

Archaeological
covered remain
which once co
log posts. Thes
because of thei
henge in Engla
dict the chang
certain ceremo
agricultural wa
1000 A.D., the
exhibition of In

CAHOKIANS

The exact fate
unknown and
decline in popu
and by 1500 A.
Around 1300 A
throughout mu
United States
fected their foo
ly difficult to
contributing fa
of natural reso
war. Whatever
Cahokia represe
prehistoric Indi



which enclosed the central city.

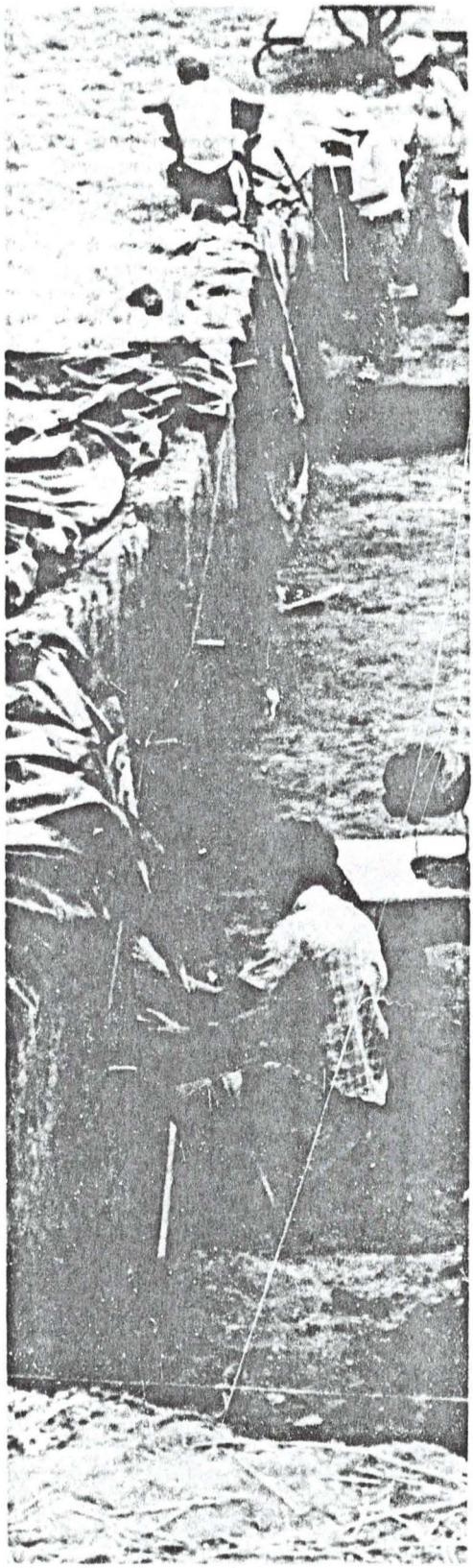
Mound 72: Excavation of a small ridgetop mound, Mound 72, revealed nearly 300 ceremonial and sacrificial burials, mostly females in mass graves. The main burial appears to be a ruler, a male of about 45 years of age, laid on a blanket or cape decorated with over 20,000 marine shell disc beads. He was surrounded by attendants who had been killed to serve him in the next world. Among the burial goods were two copper tubes, 15 carefully ground game stones (discoidals or chunky stones), a basketload of mica and nearly 800 arrowheads from various parts of the Midwest. In another part of this mound were the bones of four men with their hands and heads missing. Near them, in the largest sacrificial pit, were the skeletons of 53 young women between the ages of 15 and 25.

WOODHENGE

Archaeological excavations have partially uncovered remains of three circular sun calendars which once consisted of large, evenly spaced log posts. These calendars, named woodhenges because of their functional similarity to Stonehenge in England, were probably used to predict the changing seasons and to determine certain ceremonial periods important to an agricultural way of life. Constructed about 1000 A.D., they were an early and impressive exhibition of Indian science and engineering.

CAHOKIANS' FATE

The exact fate of the prehistoric Cahokians is unknown and many theories exist. A gradual decline in population began around 1300 A.D. and by 1500 A.D. the site had been abandoned. Around 1300 A.D. there was a climatic change throughout much of the southern part of the United States which may have adversely affected their food supply and made it increasingly difficult to feed a large population. Other contributing factors may have been depletion of natural resources, revolution, disease and war. Whatever the cause for abandonment, Cahokia represented the highest achievement of prehistoric Indian civilization north of Mexico.



Archaeological excavations at the site have been conducted by various institutions.

FACILITIES

Picnicking: There are several picnic areas with tables and stoves. Three shelter houses, playgrounds, drinking water and toilets are also available.

Archaeological Excavations: During the summer, archaeological excavations, when conducted, can be viewed by the visitor. Interpreters are available to answer questions year round.

Camping: Family camping is permitted for tents and trailers, with some electricity available. All campers must obtain a camping permit from the Site Superintendent. Groups of over 25 persons must have advance permission to enter the site.

NO CAMPING

Museum: Various aspects of prehistoric life at Cahokia are on display. Hours: 9-5 daily; closed on New Years, Christmas and Thanksgiving.

Tours: For information about guided tours and lecture programs write to the Site Interpreter, Cahokia Mounds Museum, 7850 Collinsville Road, East St. Louis, Illinois 62201; or phone (618) 344 ~~4750~~ 5268

Please: This area is for all to enjoy so help keep it clean. Put all litter in the nearest available trash container.

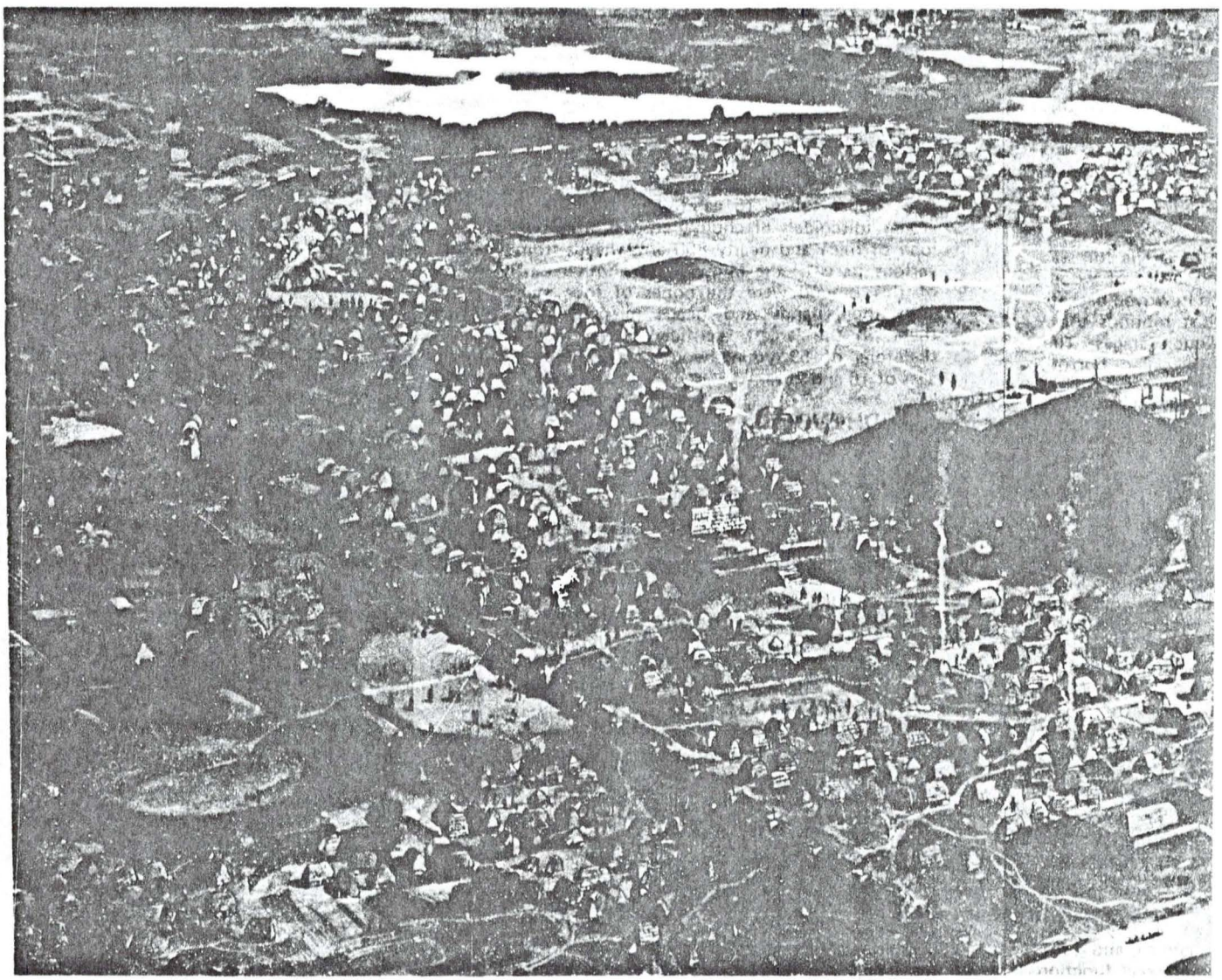
FOR YOUR INFORMATION

Groups of 25 or more persons will not be admitted to any state site unless permission from the site superintendent has been obtained to use the facilities. In addition, groups of minors must have adequate supervision and at least one responsible adult must accompany each group of 15 minors. All pets must be on a leash.

Numerous state sit
of every part of I
dining rooms are in
Beach, Starved R
Giant City; White
and dining rooms
dining rooms only
should be made with

Most state sites ar
cept on Christmas
When weather cond
of roads during fr
access to facilities is

For more details
Superintendent, 7
St. Louis, Illinois 62
For information o
the Department of
toric Sites, State
Illinois 62706.

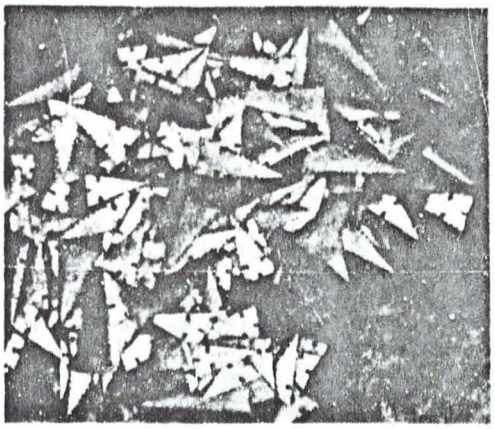


12th-century Cahokia — From the summit of Monks Mound chiefs once looked southward across a broad plaza to the twin moun in the adjoining conical mound. Some 100 other man-made mounds held official residences, temples and burials. Homes of p

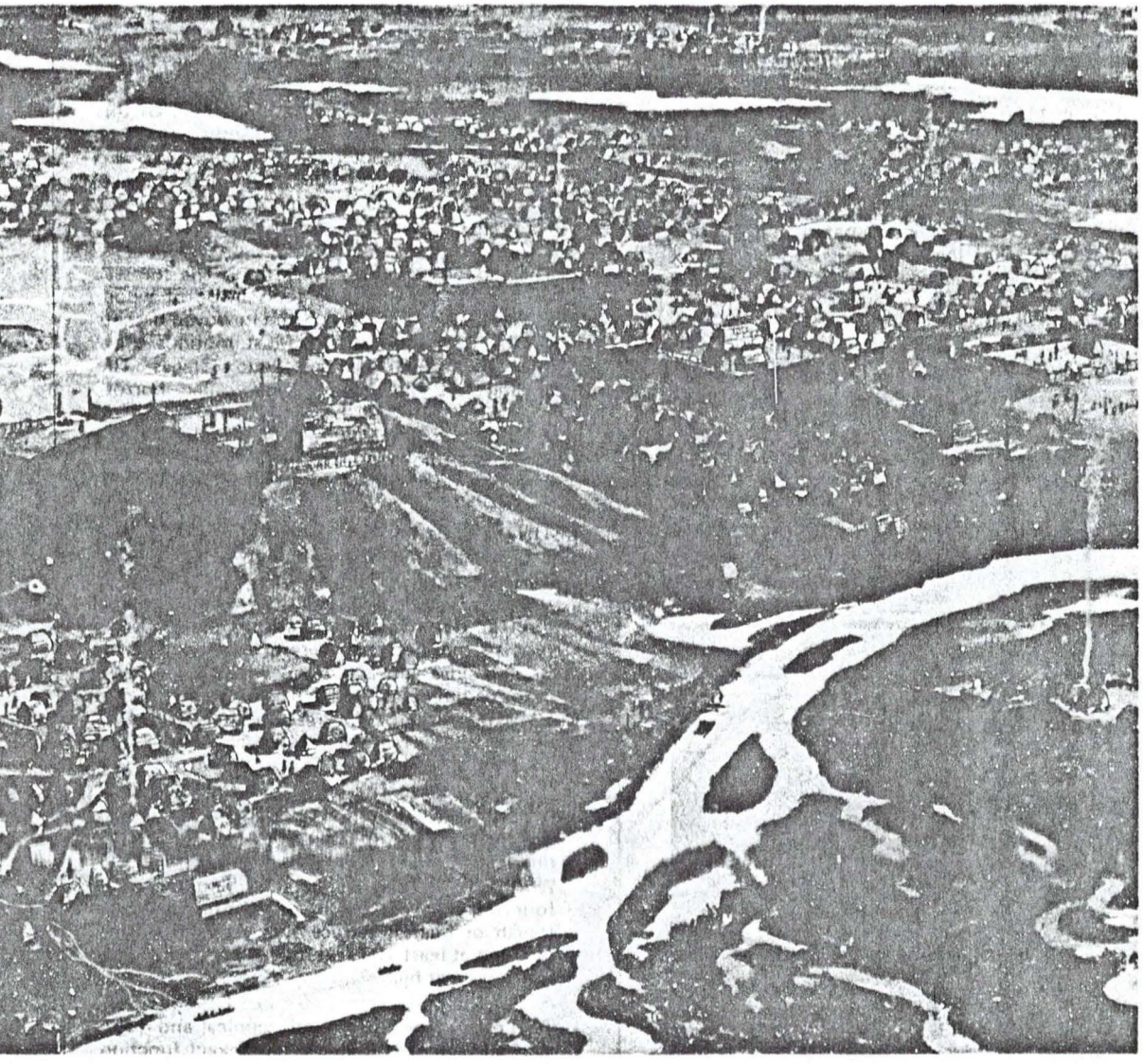
Numerous state sites are within easy access of every part of Illinois. Lodges, cabins and dining rooms are important features of Illinois Beach, Starved Rock, Pere Marquette and Giant City; White Pines Forest has cabins and dining rooms only, and Black Hawk has dining rooms only. Reservations for lodging should be made with lodge managers.

Most state sites are open the year round, except on Christmas Day and New Year's Day. When weather conditions necessitate the closing of roads during freezing and thawing periods, access to facilities is by foot only.

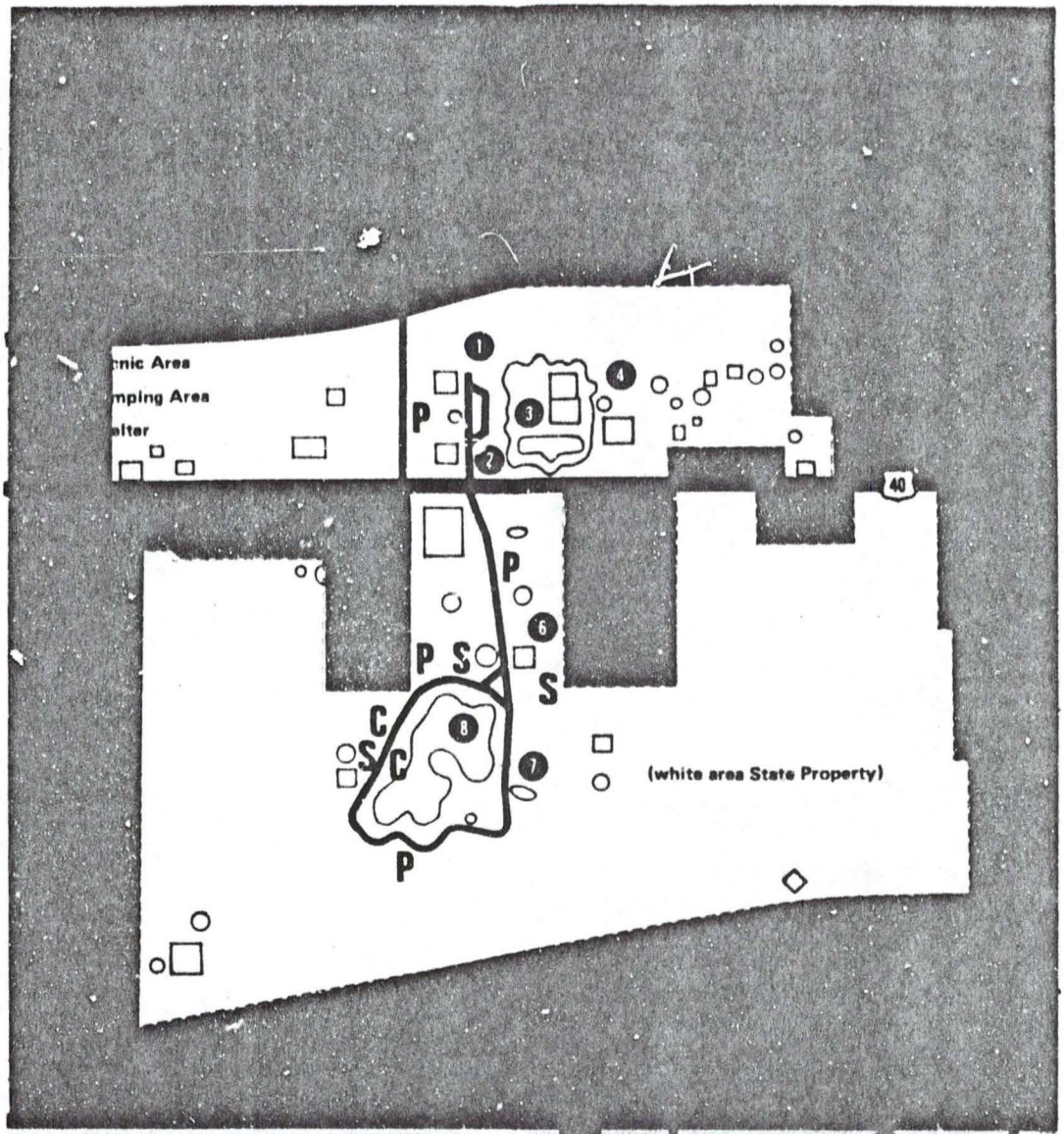
For more details about this site, contact Site Superintendent, 7850 Collinsville Road, East St. Louis, Illinois 62201; phone (618) 344-5268. For information on other Illinois sites, write the Department of Conservation, Land & Historic Sites, State Office Building, Springfield, Illinois 62706.

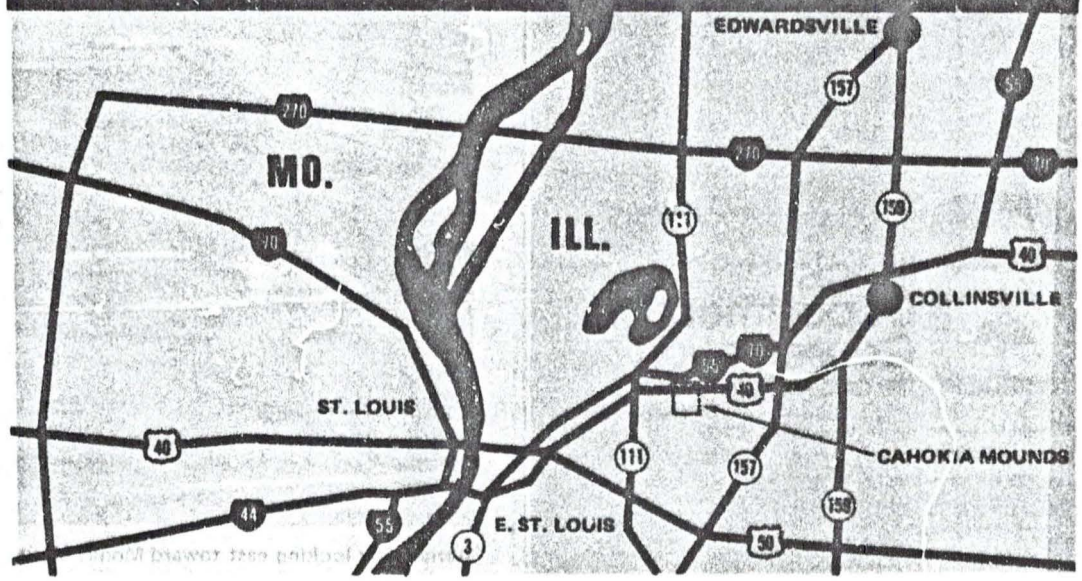


One of three arrow point caches recovered from Mound 72. (Illinois State Museum.)



broad plaza to the twin mounds. There the dead were prepared in the temple atop the truncated pyramid for burial·
ples and burials. Homes of poles thatched with grass are clustered within and beyond the 15-foot high stockade.
(National Geographic Society.)


nic Area
mping Area
lter
P
P
P S
S
C
S
C
S
P
(white area State Property)
40


EDWARDSVILLE
157
270
MO.
ILL.
55
70
COLLINSVILLE
40
ST. LOUIS
CAHOKIA MOUNDS
111
44
E. ST. LOUIS
3
50

THE "STONE FORTS" OF ILLINOIS

Walter L. Brieschke and
Frank Rackerby
University Museum
Southern Illinois University
at Carbondale

THE SO-CALLED "stone forts" of southern Illinois have been a mystery since the late 1700's when Col. Leonard White was sent to this region after the Revolutionary war (Moyers 1934:184). Over the years, it has been suggested that they are (1) defensive fortifications, (2) corrals for containment of wild and/or domesticated animals, (3) pounds, or game traps and (4) special use/ceremonial or living sites of prehistoric Indians. These "forts" are located on inaccessible bluff tops above 500 feet in elevation on the periphery of the present Shawnee National Forest. A wall of stone usually was built across the easiest routes to the top of these bluffs.

There are two major published articles that inventory these sites in southern Illinois – William N. Moyers' The Wonders of Egypt" in 1934, and Irvin M. Peithmann's 1953 work, "Stone Forts, Corrals, or Pounds." Moyers gives the first comprehensive description and Peithmann reviews the earlier work and adds one new location to the list. There are some discrepancies between these two articles but these are basically changes of site names. For purposes of clarification a correlated list of these sites is given by authors.

Locations are left out for the sake of brevity. For further information we refer interested persons to the two articles by Piethmann and Moyers.

Moyers 1934

War Bluff
Giant City
Old Stone Fort
The Pounds
Draper's Bluff
Cornish Bluff
Water Lane Pound
(Not listed)

Peithmann 1953

War Bluff
Giant City
Stonefort
The Pounds
Draper's Bluff
Trigg Stone Fort/Cornish Bluff
Indian Kitchen
Thomas Stone Fort (New)

Peithmann lists Trigg and Cornish Bluff as separate sites; however, when we checked out the local history we found that they are the same location with two different names.

Recently, with the help of local residents, Southern Illinois University Museum archaeologists have located and recorded two more sites, Hog Bluff in Johnson county, and Mill Stone Bluff in Pope county. There is now a total of 10 such sites recorded for southern Illinois. All of the large, spectacular "stone forts" have been recorded; there is a strong probability that several of the smaller ones have been missed, being located in remote sections of the Shawnee National Forest.

Within the state these "forts" are found only in the southern part of Illinois. As for eastern North America as a whole, similar stone-walled prehistoric sites are found in Alabama, Georgia, Kentucky, Missouri, Indiana, Ohio, West Virginia, Tennessee, and New York (Franke 1964). The stone walled sites must not be confused with prehistoric enclosures of earth and stone, or geometrical earth works found throughout eastern North America,

HAIRPIN TURN on Lusk Creek in Pope County. At the neck of the peninsula (center) Indian stone wall runs from bluff edge to bluff edge.

which generally date to the Middle Woodland period (B.C. 200-A.D. 400.)

In attempting to understand these sites, the first question that needs answering is: What is the age of our southern Illinois "forts?" And secondly: What is their relationship to other stone walled sites in eastern North America? The answer to the second question will take far more time and future effort to obtain. It can be stated at this time, however, that a relationship did exist because we know, on the basis of other investigations, that the prehistoric Indians of southern Illinois were trading and interacting with prehistoric Indian groups in other areas.

* * *

During the summer of 1972 the University Museum continued archaeological site location and excavation work in Hardin, Saline, Gallatin and Johnson counties. This work was funded by the Illinois Department of Conservation's Historic Sites Survey program. One of the recorded sites chosen for excavation was a small "stone fort" site in Johnson county known as Hog Bluff (SIU Museum No. 25A3-12). This site was shown to Museum archaeologists in 1971 by an interested local Indian artifact collector. Without the kind help of such individuals we would never know as much as we do about site locations in this region.

Hog Bluff was chosen for test excavation because of its (1) size (1½ acres) – it is relatively small and therefore easier to test excavate, requiring little money and personnel; (2) the fact that identifiable pottery fragments were found on the surface unlike the other known "stone forts" in southern Illinois; and (3) it had never been plowed, therefore it was relatively undisturbed.

The site is located in the Shawnee National Forest, and it was necessary to obtain a federal permit for excavation; under federal Antiquities laws it is illegal to dig up or collect from the surface historical materials on federally owned lands. Through the excellent cooperation of Forest Service personnel the necessary papers and permits were obtained and in August excavation was begun. It was hoped that these excavations would begin to answer some basic questions about the "stone forts."

The artifacts recovered from the excavations fit the types that are known to archaeologists as belonging to the Lewis Focus, the name given to Late Woodland Period sites in southern Illinois. This archaeological culture dates to approximately 600-900 A.D. One should consult Fay-Cooper Cole's 1951 book, "Kincaid: a Prehistoric Illinois Metropolis" for a detailed discussion of this culture, including illustrations of typical artifacts from this time period.

Previously these "forts" were thought to be Archaic (800-1000 B.C.) in age. A close reading of the literature, however, indicates that this term was used by Movers (1934) strictly in the sense of "old;" he spelled "archaic" in lower case letters. Subsequently people have interpreted this to be the archaeological time period labeled as "Archaic" which is much earlier and denotes a type of wandering and gathering pattern of life quite different from the sedentary Late Woodland pattern.

Two sections of the stone wall were excavated at Hog Bluff. Its base was

nine feet across. Due to the ravages of time and some vandalism only a few rocks remained to indicate its height. It would have been several feet high but it is impossible to estimate its original height because of limited information. Lewis pottery was found on and under the rocks of the wall.

In addition, a possible structure, a midden area (prehistoric garbage dump), and forty-seven 5' x 5' square were excavated randomly over the site.

The structure was defined by the heavy concentration of fire-cracked sandstone rock, a metate (large stone, containing a smooth, dish-shaped depression, used for grinding food), two round ground stone hand mullers, numerous pot sherds, a few knife blades, projectile points (arrow heads), flint chips, and daub (fire-hardened clay used for plastering structure walls).

The midden area was defined by an area of dark soil, which differed considerably in color from the surrounding yellow loess (wind-blown clay); this area contained numerous bone fragments, flint chips, and broken pottery sherds with only a few projectile points and broken pottery rim sherds. The significance of this "trash pit" lies in the fact that the bone and seed remains indicate that the Indians were processing and eating food on top of this bluff.

Together with the evidence from the the structure and midden it is possible to infer that the Indians were living on top of the bluff at least part of the year. It is hoped that when the analysis of the plant and animal remains is completed it will shed some light on the possible season of occupancy of the site. The bone presently is being analyzed by an ethnozoologist at the University of Louisville; his report should contain many insights into the dietary habits of these Late Woodland Indians.

We now have answered one important question. We know the general time of occupation of these "stone forts." But, in addition, we have generated many more questions. For example, what was the function of this type of site? (Village site, fortification, hunting camp?) What part of the year were they occupied? How do the "stone forts" of Illinois relate to "stone forts" of the surrounding states?

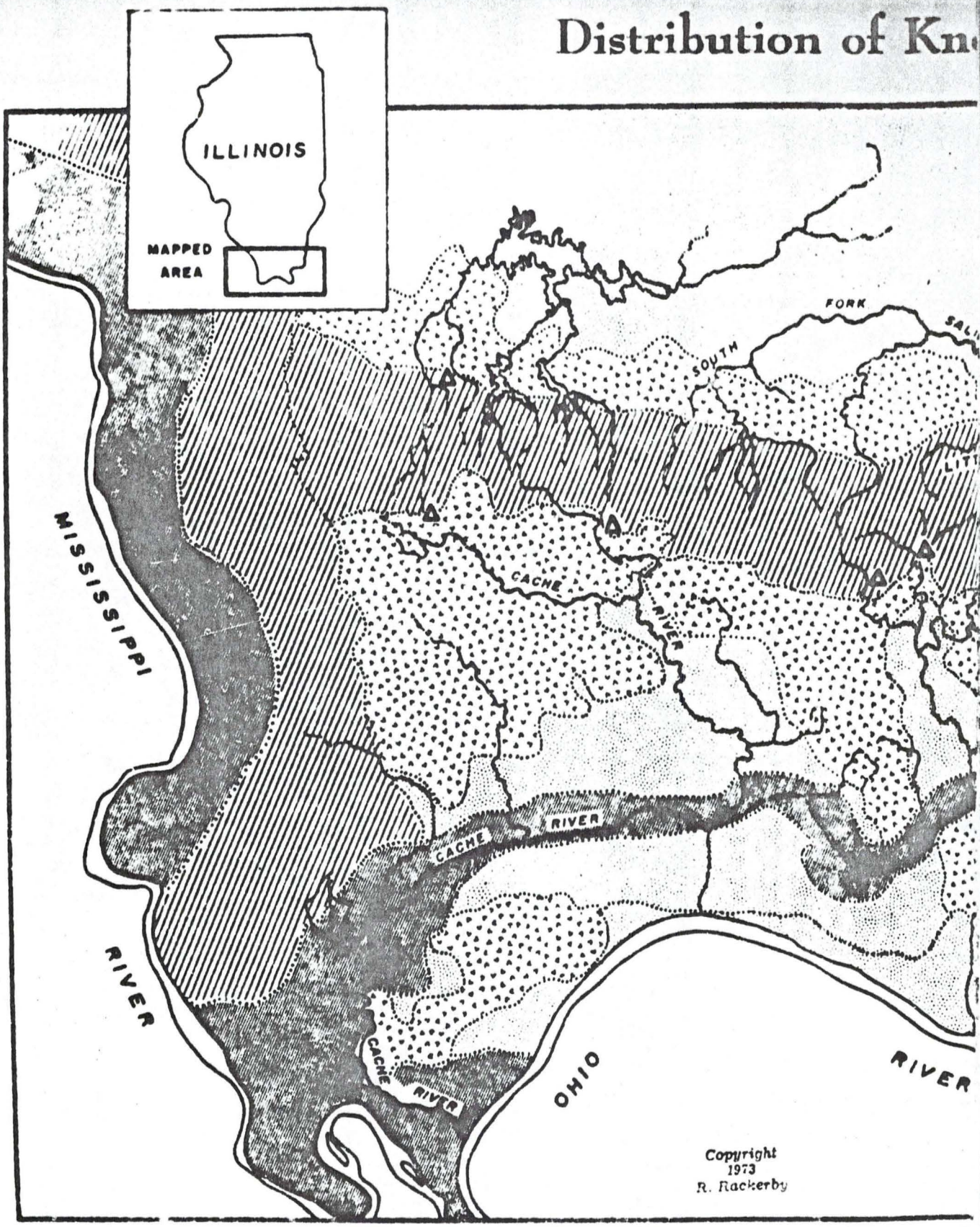
Let us look at some of the additional evidence from Hog Bluff. The potsherds recovered are predominantly "cord-impressed," with exterior lip notching on the rims; there are a few examples with incised designs. Unfortunately no whole pottery vessels were recovered to give us an idea of the different shapes or complete design patterns. These rim fragments are similar to Raymond pottery from north of Carbondale (Maxwell 1951:207), to Late Woodland pottery found at the Carlyle reservoir (Rackerby 1968:87, and Binford 1966:10), to the LaMotte and Albee "cultures" in the Wabash Valley (Winters 1967:52-66), and the Patrick Phase at Cahokia (Fowler and Hall 1972:2-3).

The other category of artifacts that are sensitive indicators of their cultural origin are the projectile points. We recovered a total of fifteen fragments and whole points, all of which are known as Lewis Focus Type (Cole 1951:169), Klunk Side-Notched (Perino 1971: 101), Lowe Flare Based (Winters 1967) and styles found at the Raymond Site (Maxwell 1951:209 plate 25).

While the above does not answer all of our questions on the relationship of

CLOSEUP OF stones excavated at wall atop Hog Bluff, in Johnson County.

Distribution of Kn



: Known "Stone Forts" in Illinois

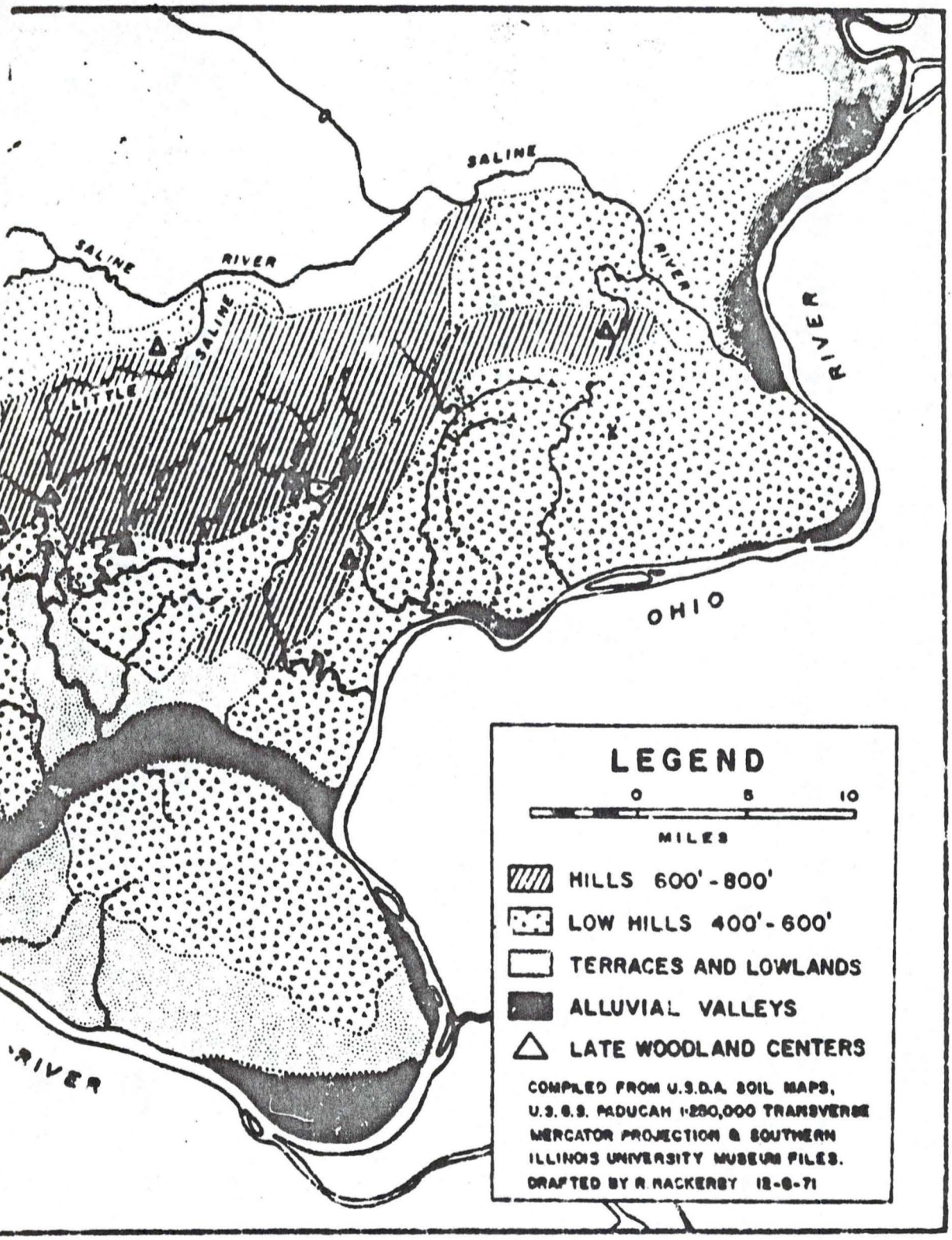


Plate 1

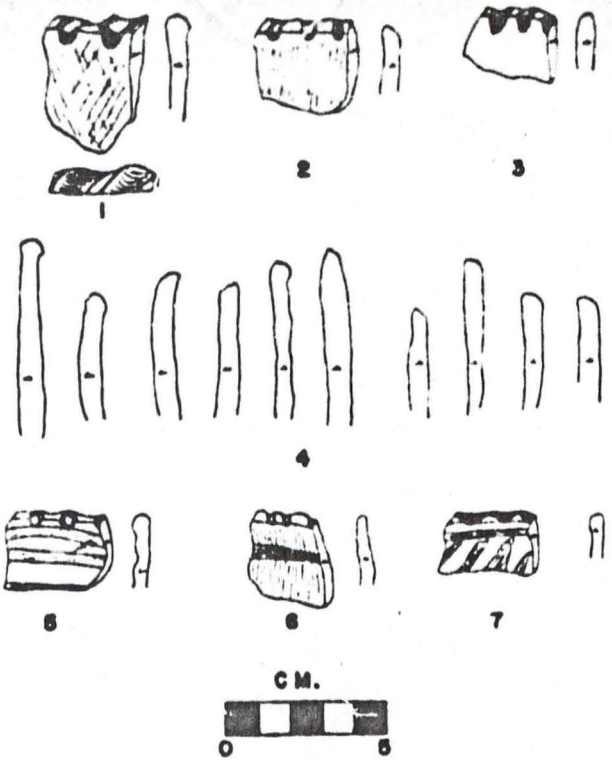
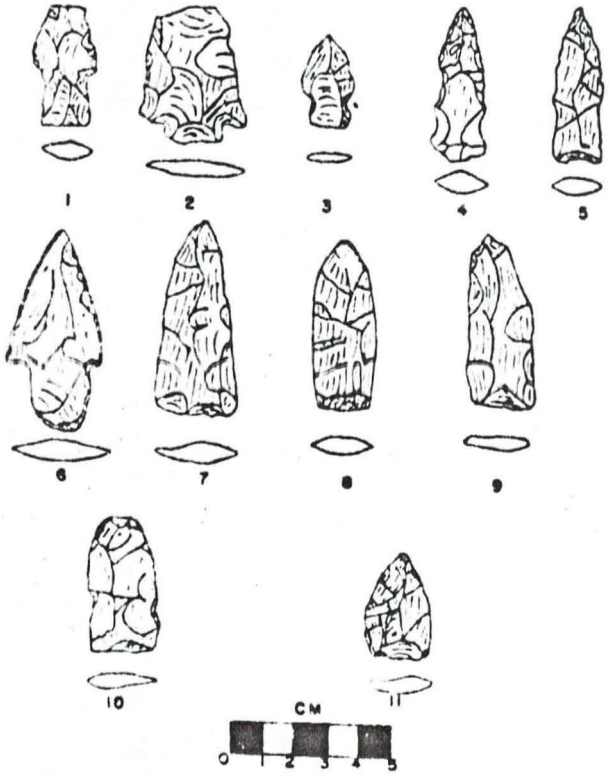


Plate 3

Plate 2

Plate 4



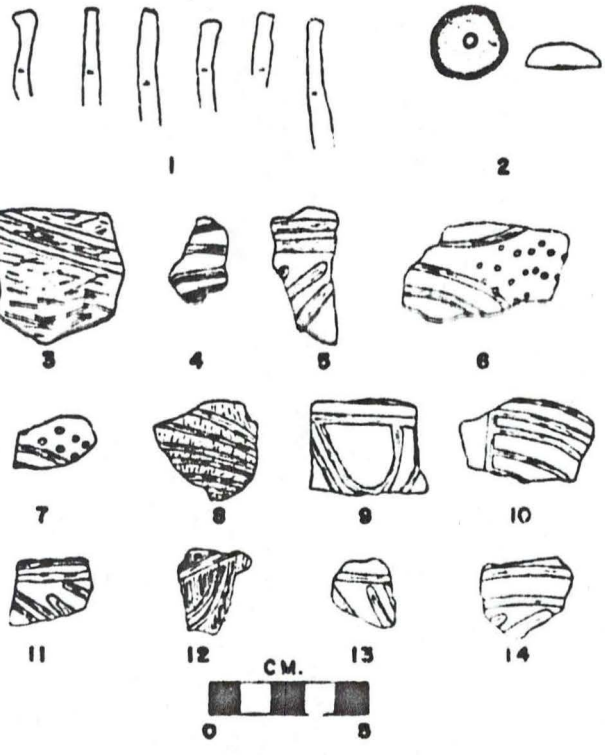


Plate 1. Projectile points: 1 & 2, Giant City Stone Fort. 3-15, Hog Bluff Stone Fort.

Plate 2. Projectile points and knives, Hog Bluff.

Hog Bluff to other areas, it is indicative that in Late Woodland times (600-900 A.D.) in the Midwest there was great artifact homogeniety which could mean the area was inhabited by very similar cultural groups.

Archaeologists always are asked the question, what were the Indians doing at a particular site or in a particular region? This is a very hard question to answer and in part depends on the information preserved in the archaeological sites. We know that these "Lewis People" (to use a general term to characterize the Indian groups that made these artifacts) inhabited open village sites in the river bottoms, and on bluff tops, rock shelters, mounds, and now "stone forts", not to mention small hunting camp sites throughout the area.

Besides these different types of sites used for various purposes at seasonal times of the year, we also have to deal with the range of time attributable to the Late Woodland Phase, generally considered 600-900 A.D., but possibly 600-1200 A.D. in this region. A lot of change can take place in 600 years. All of these things make it difficult for the archaeologist to interpret what he finds. We now will attempt an explanation of the "stone forts" and what the people were doing. This interpretation has been developed by archaeologists John Belmont and Frank Rackerby over the past three years and needs additional testing by further excavation.

During the Late Woodland time period (600 to possibly 1200 A.D.) in southern Illinois there were peoples moving into the area from the Mississippi valley; archaeologists call this prehistoric cultural manifestation "Mississippian." The time span for the Mississippian period is generally considered 900-1500 A.D. Specifically in the lower

Plate 3. Pottery rim sherds and profiles, Hog Bluff. 1-4, showing rim treatment; 5-7, showing incised decorations.

Plate 4. Hog Bluff: 1, Pottery rim sherd profiles; 2, unknown artifact of pottery; 3-4, pottery sherds with incised lines for decoration.

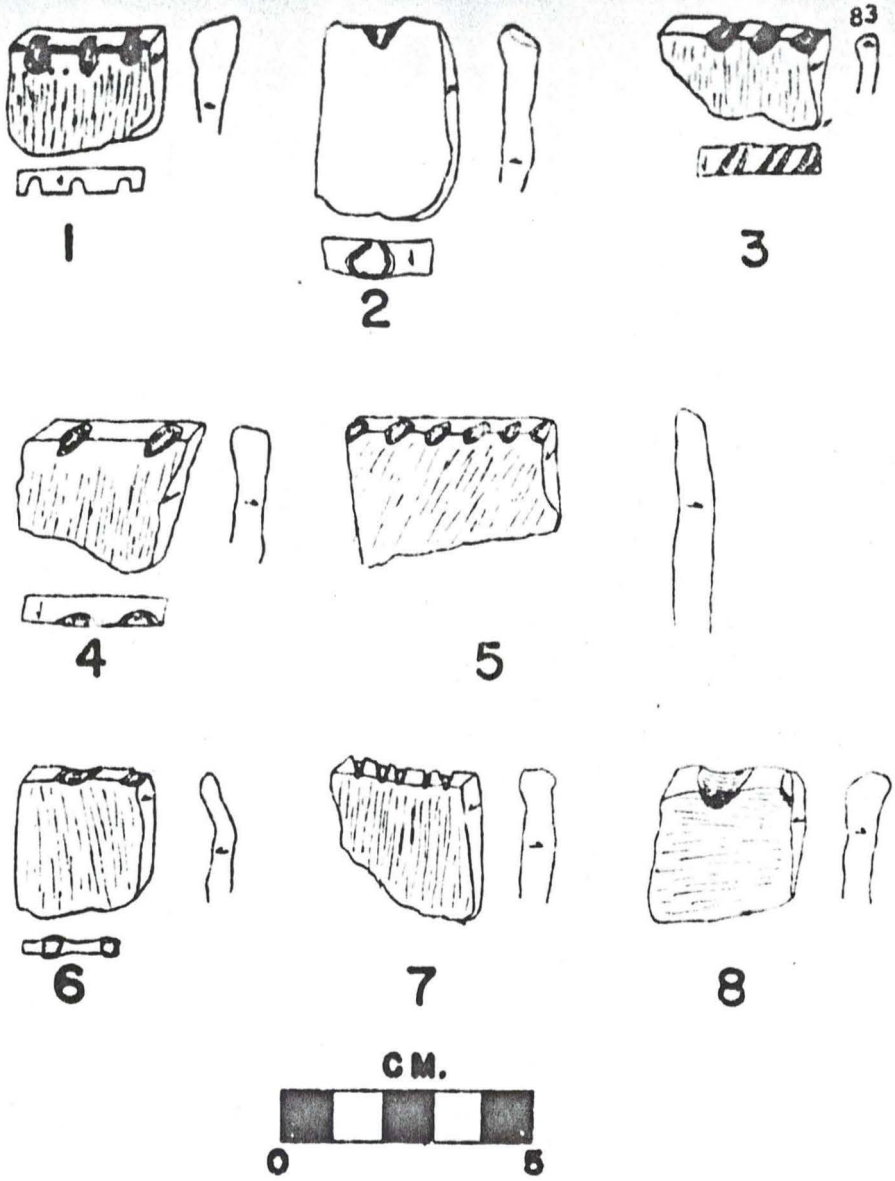


Plate 5. Hog Bluff: 1-8, pottery rim sherds showing rim treatment.

Ohio valley area the most important Mississippian site is the famous Kincaid Mound Group (Dearinger 1966:5). The Kincaid site may have been occupied as early as 1100 A.D. and was a walled city by 1400 A.D.

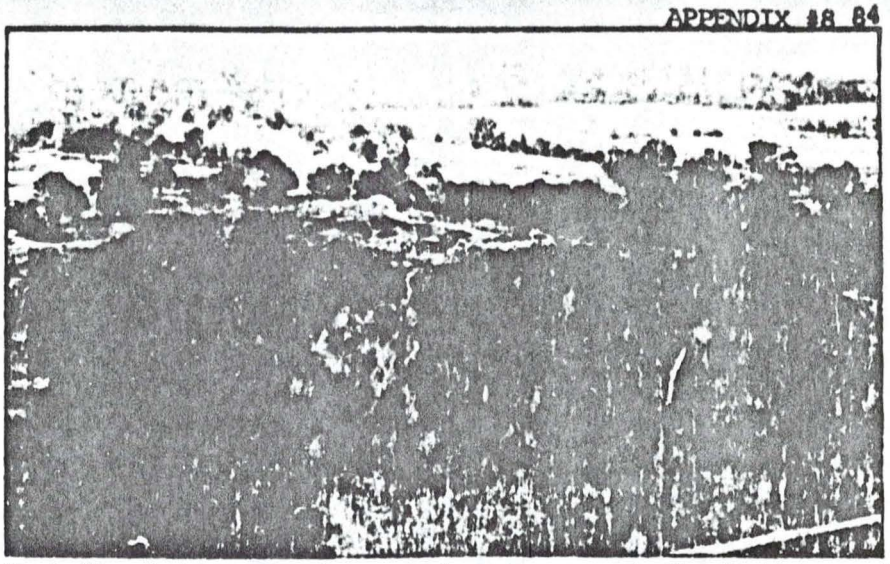
These Mississippians possessed a better way of exploiting the environment; they practiced intensive agricultural techniques to grow corn, beans, squash and other domesticated plants, plus the usual hunting of game and collecting of wild food plants. This intensive agriculture allowed them to form large social groups for longer periods of time than the "Lewis People."

The crux of the theory says that it was the contact of these two differing groups during Late Woodland times that brought on a situation of competition for the same resources. This competition took the form of open hostilities with the Mississippians pushing the "Lewis People" back up into the hills with their final conquest and/or gradual absorption into the Mississippian social framework. The "stone forts" then were part of the defensive system used by the "Lewis People." These sites were a place where they could seek refuge when in danger from attack. At other times they occupied

TDOOR HIGHLIGHTS, Vol 11, No.3
7/83 p.16

A World Landmark

Cahokia Mounds achieves World Heritage status



Monks Mound, the largest prehistoric earthern structure in the New World, is one of the main features of Cahokia Mounds State Historic Site, which is now recognized by the World Heritage List.

Cahokia Mounds State Historic Site, between Collinsville and East St. Louis, has become the 10th U.S. entry on the United Nations' prestigious World Heritage List of premier cultural, natural and historical properties.

Owned by the Illinois Department of Conservation, Cahokia Mounds is the remains of a highly-developed prehistoric Indian city and civilization that is rated one of North America's most significant archaeological sites.

The mounds site was voted to the List recently in Paris by the World Heritage Committee, an arm of the UN's 53-nation International Convention for the Protection of the World Cultural and Natural Heritage. The Convention maintains and oversees the global roster.

Lawrence Aten, chief of the National Park Service's Interagency Resources Management Division, said Cahokia Mounds was nominated for the honor in May 1981, by a U.S. commitee charged with proposing American sites to the world body. The 18-month delay between nomination and acceptance is not unusual since the World Heritage Committee meets annually, said Aten. It was Aten who notified the Conservation Department of the honor. No formal announcement of the World Committee's action has come yet from its Paris headquarters.

Inclusion on the world list will bring no monetary award or provide binding protection, according to Aten, but it heightens public interest locally and "ascribes an important level of prestige and recognition worldwide to the Mounds."

"As a consequence, Cahokia Mounds acquires a certain amount of influence in its own preservation," Aten added. A bronze commemorative plaque probably will be presented to the site by the World Heritage Convention, but confirmation of this may await formal announcement of Cahokia's selection, he said.

Cahokia Mounds is the first Illinois site named to the world registry of places "having transcendental world significance, important beyond national boundaries," Aten reported. It also is the only non-federal property among 10 in the United States recognized since the World Heritage Convention was established in 1975, and it is the only U.S. site added since October 1981.

The other nine U.S. sites, and the year they were accepted: Yellowstone National Park, Wyoming, 1978; Mesa Verde National Park, Colorado, 1978; Independence Hall, Philadelphia, 1979; Everglades National Park, Florida, 1979; Grand Canyon National Park, Arizona, 1979; Wrangell-St. Elias National Park, Alaska, 1979; Redwood National Park, California, 1980; Mammoth Cave National Park, Kentucky, 1981; and Olympic National Park, Washington, 1981.

Cahokia was proposed unsuccessfully for nomination in 1977. The ancient cliff dwelling Indian city at Mesa Verde was chosen instead that year by the U.S. committee, which is composed of experts in architecture, archaeology, natural science, history and cultural resources from such agencies at the Department of the Interior, Smithsonian Institution, State Department, and Environmental Protection Agency.

Aten said the Cahokia nomination received vigorous support from the World Committee's staff. But a major factor in its final approval was a letter from Gov. James Thompson indicating strong state commitment to Cahokia's preservation and expansion, and recognition of its importance to Illinois, Aten reported. "A key element in selection of a site to the World Heritage List is solid local commitment to its protection," he said. Thompson's letter, addressed to the Department of the Interior, was read at the World Committee's meeting.

The 1,300-acre Cahokia Mounds State Historic Site protects features of a prehistoric Indian city that appears to have encompassed about six square miles and was the hub of a complex of satellite communities, connecting roads, extensive trade network, and well-developed agricultural system between 900 and 1400 A.D. Estimates of its population range from 11,000 to 40,000 people.

The ancient community contained as many as 120 mounds, the largest (Monk's Mound) covering 14 acres and rising to a height of 100 feet. As much as 300 acres of the central section of the city was enclosed by a protective log palisade.

Both the city and its people literally mysteriously disappeared before the first Europeans arrived in the area, about 1500 A.D.

The site's importance was recognized before the turn of the century by archaeologists and many local residents who worked to have it protected.

Incremental Analysis

We can see that certain alternatives are mandated by law, "No Action". The requirement that all others be feasible and practical is also inherent within the intent of this same law. It is necessary to establish sideboards to show that the analyzed alternatives are comprehensive and that no viable alternatives are left out.

This thought process leads us to a range of actions from the legally required to goal achieving and on to unnecessary expenditures with no gain in service or protection. The "No Action" alternative (continue management as at present) represents the minimum level of effort to be expended. Depending then on what will be the objectives, an alternative to achieve that objective within dollar and manpower constrains would be a more preferred management action. In reality all the various ways of accomplishing the objectives that meet the feasibility criteria are the true alternatives to be analyzed. Goal achievement and feasibility become the sideboards to erect on each side of the alternative developement scheme. As the alternatives fail to achieve the stated objectives to a greater degree the further one finds oneself away from the preferred alternative. As services, controls and site modification move beyond those actually needed the more infeasible the alternatives become. This appears easy to say and hard to apply. An analysis can be used to see to what extent increased expenditures actually produce increased service. For example, in trail establishment if use is expected to be no more than what natural surface can sustain, then doubling the expected use and evaluating the need for trail hardening will give a good idea as to what changes in use level would be needed to require increased expenditures. Whithin each material used to harden the trail a range

of use, from the amount required to provide surfacing, to the amount needed to require the next higher level of surfacing, exists. This allows an estimate of variation within the expenditure that tells one whether the side boards are adequate to protect the resource or reduce maintenance costs, etc.

An example to further explain this thought is:

Natural soil - support with no loss -	0-100 people/day/Rec Season
Gravel Surfaced 2"	0-500 people/day/Rec Season
Paved Surface - 2" black top -	0-1000 people/day/Rec/Season

Costing out the expenditure gives an idea quickly as to whether surfacing is required and how much.

Cost Estimate For Alternative Developement

Trail layout minor grading and signing estimate	$100/1000'
Gravel or Black Crete surfacing - one man day/2 Tons @$27/day plus $20 per day equipment use @ 20 tons/1000' =	$470/1000'
Gravel 8.00/Ton @ 20 Ton/1000' =	$160/1000'
Black Crete 22.00/Ton @ 20 Ton/1000' =	$440/1000'

Natural Soil	Gravel Surfaced	Black Top Surfaced
$100/1000'	$160 Gravel	$440 Black crete
	$270 Labor	$270 Labor
	$200 Equipment	$200 Equipment
	$100 Trail layout and grading	$100 Trail layout & grading

(Continued on next page)

Natural Soil	Gravel Surfaced	Black Top Surfaced
$100/1000'	$730/1000'	1010/1000'
$0.10/ft	$0.73/ft	$1.01/ft
50 PAOT = $0.002/PAOT/ft	365 PAOT=$0.002/PAOT/ft	505 PAOT=$0.002/PAOT/ft
*0-100 PAOT	0-500 PAOT	0-1000 PAOT

*=Estimate of use range for each curfacing condition

If use is not expected to exceed 50 PAOT, then natural surface is cheapest, as use goes up then each class of surface becomes more economical on a per person basis. Now if we doubled our expected use, you would move into the next higher class. To exceed the next higher class a 5 fold increase would be required. It is highly unlikely that your original estimate would be that much in error. We know the importance of proper estimates of use and cost but in no way does the need for precise figures deter the manager from being able to make valid decisions early in the alternative development stage. Similar comparisons could be made for each cost item within the project i.e., signs by different types or structures by different materials used.

A need to recognize maintenance as a cost item and follow a rationale process in developing the facilities maintenance cost, along with the construction costs, cannot be over emphasized. When dealing with high use, maintenance costs will often require the need for a higher initial investment. Conversely maintenance needs that are a long time frame away will not generally justify a large investment initially.

An analysis of maintenance cost and an application of how increasing cost justify larger initial expenditures follows.

Trail Maintenance Evaluation

	Natural Soil*(1)	Gravel Surfaced (2)	Paved (Blacktop) (3)
Bi-annual Insp.	$10	$10	$10
Debris Removal	27	27	27
Water bar Repair	27	14	0
Remarking & Signing	20	20	20
	$84	$71	$57
Initial Investment	$100	$730	$1010
Present Net Worth of Maintenance	590	498	400
Total	$690	$1228	$1410

Using formula for Present Net Worth $Po = b \dfrac{1 - \frac{1}{(1+r)^n}}{r}$

Po = Present Value

b = Cost of Maintenance

r = Entrest Rate

n = Number of Years

$(1+r)^n$ = Taken from table in appendix

Solving for each maintenance cost yields using n = 10 years, r = 7%

$$Po = b \quad \frac{1 - \frac{1}{1.9672}}{.07} = b\ (7.0243)$$

$b^1 = \$\ 84$ $b^2 = \$\ 71$ $b^3 = \$\ 57$

$b^1 = \$590$ $b^2 = \$498$ $b^3 = \$400$

Total cost of construction plus maintenance for each condition now is:

Natural Soil = $690 Gravel Surface = $1228 Paved = $1410

If maintenance costs for natural soil increased to $160 per year per 1000', we would find that the discounted total cost would be $1224. This would make natural soil versus gravel nearly equal in discounted dollars. Likewise, an increase of maintenance cost to $185 per annum would yield a cost of $1499.00 very near the discounted cost of a paved trail.

As a practical outcome of this direct analysis, the feasible alternatives can be identified and infeasible ones can be dropped from consideration.

To arrive at a cost-benefit ratio one now needs to develop the benefits that acrue from the planned alternatives and a comparison to see which one yields the most favorable ratio usually will indicate the preferred alternative. This statement needs to be "hedged", as many factors come to play here and really clear cut answers are hard to find. In a non charge recreational development several assumptions will need to be made to arrive at a benefit value.

In our instance estimating expected use at Millstone to be 25 people per day per season of 280 days and each visit occupying 2 hours yields us 1167 visitor days. Assigning a $3.00 per day value to each day yields a benefit of $3500 for the development. We must recognize that use without development would have value also. For this problem we will assume that the benefits received will be ½ the total value assigned to the use of the area.

What is the discounted value of this benefit? Using the same formula and factors as for discounting costs we arrive at $24,585, one half of which would be $12,292.

$$Po = b \frac{1 - \frac{1}{(1+r)^n}}{r} \quad \text{or} \quad PO = 3500 \frac{1 - \frac{1}{1.9672}}{.07} = 3500 \times 7.0243$$

Where:

Po = Present worth of constant stream of benefits received each year

b = Annual benefit

n = Number of years (10 years for example purpose)

r = Percentage discount factor. Set by O.M.B. at 7%

As long as our expenditures do not exceed $12,292 we can predict a positive cost benefit ratio. If one were able to claim the total benefit against a portion of the cost we could stop here. However a need to identify total cost for the alternative cannot be denied.

From our objectives we see a need also for interpretive signing and an analysis of a variety of alternatives to cover again the range from minimum management action to preferred objective accomplishment, the same as we did for the type of trail. Lets not cramp our thinking by using signing as the only way to accomplish our objective. Let's consider "information provision" as the objective to see if other than signing is a viable alternative.

The range of opportunities runs from a fully manned operation to a newsprint handout provided at the site. To narrow the field to a manageable level requires some decision making and some analysis. Some of the possibilities are cheap on initial investment and long on future costs. Care should be taken in weeding through the different types so that the best ones are retained. Contacts with other agencies

primarily involved in outdoor exhibits helps reduce the number for consideration. (See Appendix #2 for listing).

The following list of possibilities was considered and rejected due to being impractical.

1. Plastic laminated - too expensive in the future.
2. Newsprint handouts - Same as above.
3. Phamplets with numbered stations - Same as above.
4. Electronic message through radio transmitter - Too expensive.

From this investigators discussion with several manufactures and governmental agencies design departments these following relative costs were developed.

1.	Phamplets and Markers	$8043
2.	Electronic	$7000
3.	Wood	$5106
4.	Metal Photo	$5177
5.	Stone	$4687

(See Appendix #1 for cost development and discussion on relative merits).

A further discussion with the National Park Service Wayside Exhibits Department at Harpersferry, West Virginia reversed the ranking for metal photo and fiberglass embedment. In their opinion metal photo would be the cheapest. However, present Forest Service experience indicates metal photo the most expensive. The problem to be confronted by any manager, early in the planning stage, will be the establishment of relative values for decision making. The actual costs will never

be known until final plans have been developed and submitted for price quotes. While this presents some confusion, it is the opinion of this investigator that the figures represent ball park figures that will allow a decision to be made. This investigator for one, would not want to distinguish between the best three or four choices until the actual interpretive messages were developed. A testing of the use of stone to develop a better cost figure would be prudent also. This medium appears as cheap as wood to produce but in actual practice may vary somewhat. The high degree of compatability of this medium would make further investigation desirable.

One must never forget safety in the planning or development stage. The hazards encountered must be removed or mitigated before public use is invited on developed facilities. Since a trail appears most advantageous, hazard trees would need to be removed. The actual area is surrounded by a low bluff 20 feet high. The stops on the trail where they are next to the drop off will need barriers of rails to protect the users. Since this will be the same for all alternatives developed, it will only be mentioned here and actual costs developed in the final plan.

In summary, a good alternative is built similar to a brick wall. Each component can be analyzed separately. This allows only usable elements to be combined to produce the final alternative or range of alternatives. This process leads one to feasible as well as infeasible schemes. This establishes the sideboards necessary to show that the range of alternatives developed are the ones to be analyzed. All alternatives developed should be viable and effective ways to accomplish the objective.

Appendix #10

MILLSTONE BLUFF

NATIONAL HISTORIC SITE

Interpretive Project Plan

II Summary

A study of Millstone Bluff was made and reported on as a project for the Recreation Short Course at Clemson University, Clemson, South Carolina.

The type of facilities needed and expected use levels were analyzed. While this is an attractive feature, the total use level is not expected to be gigantic. An estimate of 25 people per day for the use season is considered to be valid. This use level will not permit large investments and retain a positive cost benefit ratio. However, a modest developement can be expected to retain a plus benefit and also provide for several objectives at the same time.

A trail is considered necessary as several of the features can be difficult to locate and in the past visitors were often unable to see all the features present. The trail standard needed was analyzed and a primitive trail with natural surface is all that is needed.

Signing and other methods analyzed narrowed the field of consideration to four basic types of material for signs - wood, stone, metal photo, fiberglass. While all four are relatively equal, fiberglass embedment appears to be the best. There are six features to be interpreted: an abondoned Millstone, stone walls, two sets of petroglyphs, a cemetary and a village site. In addition to these signs, one covering the history of Millstone Bluff and one setting the Interpretive theme will be needed.

This easy trail, approximately 1700 feet long, with interpretive messages, will be designed to solicit public awareness of the protection needs for

cultural resources. A natural soil trail with low simple signing will maintain the natural character of the area.

The project is planned for FY ? and is expected to cost $12000 with a cost benefit ratio of 1 .

III Purpose and Objectives

Millstone Bluff represents an unusually good opportunity to expose the public to the undesirable effects of indiscriminate artifact hunting. The large cemetary found in this site has been badly looted destroying for all time the ability of determining many social and environmental factors relating to the use of the area. Lots of questions could have been answered had the work of uncovering the secrets buried with the people been done by professionally trained investigators.

An effort needs to be started to bring home to the general public the need for complete protection of these sites. Pot hunting and artifact collecting have a long tradition in this part of the midwest. The need for increased protection could be easily demonstrated here. This site has a long history of public viewing and is well known in the area. However there has been no attempt to inform or educate the public concerning how this site fits into the larger Regional context.

Public support for protection will come as a result of their enlightenment and appreciation of cultural resources through interpretation. This is the vehicle to produce the intelligent user of fragile and rare resources entrusted to our care.

Objectives

To interpret a valuable part of our national heritage for (1) the education and enjoyment of the public, (2) protection of the site, (3) enlist public support for protecting cultural resources.

IV Site Description

*Millstone Knob

Millstone Bluff rises 320 feet above the comparatively flat surrounding agricultural land. The top of the Bluff is egg shaped with the large end to the west. The top, about 3 acres in size, is covered with a thick layer of leaves and mulch, is densely wooded and rimmed with low cliffs. On the south and southeast aspects access to the top is through narrow crevasses in the rimrock. Situated a little west of center, at the top of the Bluff, is a flat area (about 100' in diameter), obviously a Village Plaza. Surrounding this plaza, in more or less regular fashion, there are 8 house depressions, each about 12 feet in diameter. At least 9 other depressions occur randomly near the village site.

Northeast of, but very near, the village site is an extensive burial area. Approximately 50 rocklined crypts remain. The crypts were originally rocked capped. Most, if not all, of the graves have been looted.

The low cliffs previously mentioned are cut by several major crevasses. Where these crevasses could have provided prehistoric access, it is clear attempts were made to wall in the Bluff. There is evidence of the existence of several stonewalls on the Bluff. The obvious conclusion is that the village site was fortified.

Petroglyphs resembling a bears paw, an eagle with spread wings, peace pipes, a cross with a circle and what appears to be a map occur on bench rock located at the western periphery of the Bluff top.

*(Description in part from Lowell A. Dearingers article, "Millstone Knob" which appeared in the July, 1963 issue of Outdoor Illinois.)

*Statement of Significance

Millstone Bluff is undisturbed by plowing or other destructive activities, it is one of the very few undisturbed prehistoric sites in the Eastern North America's. Most other similar prehistoric sites in the area have had their surfaces altered.

As previously mentioned, this site has sections of prehistoric stone wall standing in various places. Stone walled sites in the Eastern United States are generally an archeological mystery; however, we have good cultural associations at Millstone Bluff.

There is a well defined cemetary precinct at the site. While some of the graves have been looted, there is a strong possibility that unlooted graves are to be found; unlooted stone box graves are a rarity in Eastern North America.

Several visible circular house depressions are situated around a central "plaza" area, again undisturbed. These are most probably of a Mississippian (1000-1560 AD) affiliation.

Numerous petroglyphs (rock carvings) are present including birds, mandellas, male and female human stick figures, and other geometrical motifs. Petroglyphs

associated with a habitation site are extremely rare, let alone an undisturbed site.

Several Mississippian and late Woodland (Lewis Focus) pottery shreds have been recovered from the surface of the site. On the basis of 1972 excavations the Southern Illinois University Museum has determined that stone "forts" were occupied in late Woodland times (600-1000 AD) in Southern Illinois.

Millstone Bluff is a unique, undisturbed, prehistoric site, because of its excellent preservation, and types of cultural features present. Although not yet excavated, it is worthy of nomination to the National Register on the basis of surface evidence alone.

*Significance Statement Prepared by:

Frank Rackerby
Curator of North American Archeology
University Museum, Southern Illinois
University at Carbondale

So states the two documents that placed Millstone Bluff on the National Register of Historic places October the 15th, 1973.

Proposed Trail Developement

Situated on the south side of this knob is an old limestone quarry at approximately 640 feet of elevation. The top of Millstone Bluff rises to an elevation of 720 feet above the valley floor which is a little below 400 foot elevation. This relatively gentle terrain will allow easy access by way of a trail onto the top of the Bluff. A low cliff circles the top

of Millstone Bluff and will necessitate either switch backs in trail construction or a flight of steps through one of the crevasses leading to the top of the cliff. The road that served the old quarry and the floor of the quarry provide an already constructed access road and parking area. Another old road leads from the quarry east out the low ridge toward private ground. This probably served a historic house site destroyed by the quarry operation. Little improvement would occur by using the old road to gain a closer vehicle access to the Bluff top. The nature of the land would necessitate steps or other barriers to mobility impaired visitors. For the most part the access way to the village site would require little site disturbance. However, the last few hundred feet must rise through the Bluff itself. There would be no way to produce a grade of 5 percent or less without major site disturbance. Trails with greater than 5 percent slopes would not be negotiable by wheel chairs. The best solution appears to be to produce an easy trail with a flight of stairs crossing the bluff line. This would concentrate the barrier in one location allowing the use of aides or volunteers to assist in making the area available to the mobility impaired.

V Audience Analysis

The major portion of users comes from the immediate surrounding area. It is expected that 80% or more will come from no farther away than Carbondale, Illinois, Evansville, Indiana, or Paducah, Kentucky. The visitors using the area will tend toward the older age group. There will be no physical challenge here which will tend to discourage younger users. The primary pursuit will be educational and entertainment and not skill testing or risk taking. This facility will provide an excellent opportunity for schools and or educational groups. The present expectation of

use is estimated to be no more than 25 people per day during the peak recreation season. (10 car parking lot @ 2.5 people per car.)

VI Coordination With Other Plans and Facilities

This particular cultural group, the "Mississippians", is being extensively interpreted at Cahokia Mounds at East St. Louis, Illinois. A reference at Millstone could direct those with an interest in the larger picture to visit some of the other sites available. Since this area is somewhat remote from the Cahokia Mounds site, the full story of the Wood land and Mississippian people could be developed. The sub-topic of protection can be woven into the stories. This site is located close to other recreation facilities, Lake Glendale Recreation Area, which poses no particular need for other than day use with an estimated two hour visit time. The present road and parking area appear adequate into the near future. Sufficient area exists to expand to double the parking area in the future with very limited expenditure. Expecting a two hour visit time no need for a portable water or sanitary facilities is anticipated. To provide facilities that would produce greater staying time than needed to view the site would create a situation where the users would be looking for further activities not compatable with the original development scheme.

VII Interpretive Stories

Late Woodland occupancy and Stone wall enclosed villagesite later Mississippian occupancy. This low land farmer type cultural group chose also to occupy a hill top for a village site, and from all evidence for a long period of time. This poses several interesting questions. Were

these occupancies connected to the religions practiced by these groups? Why impose the obvious hardship of living away from your fields and water supplys? Was this area of some special significance to these people? This area represents one of the very few sites where both late Woodland and Mississippian groups occuppied the same site. This area remains in a relative undisturbed condition today. A good theme for Millstone Bluff is "The Mystery of Millstone". What happened to these people? Why did they choose to live here? Where did they go? A second story to develope is How the Bluff Got its Name and What Caused the Formation of This Knob. The hard resistant sandstone used by early settlers to produce Millstones established the name of this Bluff.

The History of Millstone

Indian groups have lived in this area for about 10,000 years and include groups we know as, Paleo-, Archaic-, Woodland-, and Mississippian-Indians.

Woodland people first used this bluff and built a stone enclosure about 1200 years ago. Was this a fort? What did they do here? Later Mississippians moved onto the Bluff and built a village. Why did this typically low land people want to live on this Bluff? Where did the Woodland people go? Did the Mississippians use the stone enclosure? The rock carvings known as "Petroglyphs" were made during the latter occupation. What do these rock carvings mean? About 900 years ago the Indians abandoned the area. Why and where did they go?

The latest settlers found a new and different use for this interesting place. The hard sandstone cap rock was ideally suited for the productions of Millstones to be used in grist mills to grind flour. Many local mills secured their grind stones from this area and created the modern name for this Bluff.

The quarry area was the latest use made of the limestone underlaying this area. This stone was mined for roads and some say the first fertility experiments using agricultural lime for soil productivity improvement.

The Mystery of Millstone

What happened to the largest prehistoric Indian civilization in America? The answers to this puzzle may be found on Millstone. This area, relatively undisturbed could yield answers to many questions. Could the fate of the Mississippians be waiting for us? We know they left the area very rapidly but, why? A lot of the information that was on Millstone has since been destroyed by thoughtless relic hunters. Total destruction of the original cemetary eliminated a real opportunity to understand much of what went on during the Indians stay. The remains on Millstone must be protected and preserved if answers to any of our questions are to be gained. Visiting the site will provide a glimpse of America's cultural heritage. Help solve the mystery of Millstone by protecting the area, so the remaining clues can be put together to solve this puzzle.

MILLSTONE

This very hard sandstone caprock on Millstone Bluff protected the soft underlying limestone strata and produce a knob. This sandstone, some of which was in uniform layers, was found to be suitable for grindstones in the earliest grist mills of the area. The rugged topography of Southern Illinois, provided sites for water powered grist mills. A nearby stream was once named Mill Branch. One grist mill was located on Bay Creek, the drainage below the knob, and another on Cedar Creek east of Millstone a few

miles. Several remanents of attempts to produce Millstones can still be found in the area. One near the top of the knob, broke in the final shaping, and remains as testimony to the name for the area.

Petroglyphs

These unusual rock carvings represent a very unique resource. These figures, in conjunction with evidence of a Mississippian village, represent a very rare combination. The petroglyphs are associated with the Mississippian habitation of the Bluff. They are thought to have a connection to the religious practices of the people. These religious practices may be related to the Green Corn Ceremony practiced by many historic Southeast Indian groups. The long serpentine ones may represent some form of a map and some investigators are able to interpret the form to be the Ohio River and some of its intersecting drainages.

The "Thunderbird", thought to be an Eagle, but may be a turkey, is considered by some to point to other major occupancy sites. The "Sun Wheel" is considered by some to have the following meaning: "In the circle the line had no begining and no end, but is continuing or 'eternal'. The cross points to each of the four cardinal points meaning 'everywhere' or as we would say 'universal'. The Eternal Universe thought - - - to these people this meant the Great Spirit, our term is 'God'." (L.A. Dearinger 1963)

The elbow pipe symbols signify the use of tobacco and often represented a religious context to the carvings.

The corn plant carving is very representative of the Mississippian culture. Corn, along with squash and beans, were the staple foods grown by the people.

Most Mississippian sites are along the major Ohio River drainages and extensively in the bottom lands.

The petroglyphs of Mississippian culture have been related to certain ritual elements of the Green Corn Ceremony practised by historic Southeastern Indian groups. Ceremony occurs annually near time of maturing green corn and serves as a agriculture rite. Other important elements of the rite are

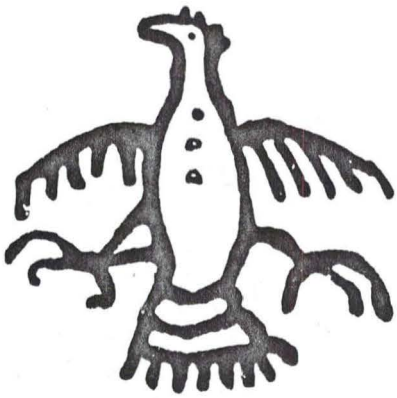
1. to purify and regenerate sacred fire to keep families in good health.
2. foster social unity through common religious grounds.
3. perpetuate spiritual counterparts of various animals and birds.
4. formal ceremonial occasion for noteable war like deeds and initiation of young men.
5. fertility ceremony for wild plant foods and bean, squash, and corn.
6. success in hunting and warfare.

It is proposed that the archeological site layout of Mississippian villages is similiar to that displayed by ceremony grounds of historic tribes.

Most major symbols utilized for this ceremony are found at Millstone Bluff. The symbols include the cross and sun circle, a raptorial bird, serpentine, spider, and God-Animal representations. These motifs are found on Mississippian artifacts including shell and copper gorgets, mask gorgets, columella pendants, embossed copper plates, ear spools, batons, hafted celt, axes, effigy pipes, discoidals, bowls, ceremonial flints, and bottles.

CROSS MOTIF

This motif identifies with the fire-sun-deity complex. It plays central role in ceremony and can be found on many other symbols. Represents the concept of a sacred fire (the sun) which is fed by 4 logs oriented to 4 cardinal points (cross). The sacred fire visually occupies the center of the square plaza and most sacred dances are performed around it. The Supreme Deity is associated with the sun symbolizing the Supreme Sky Being.

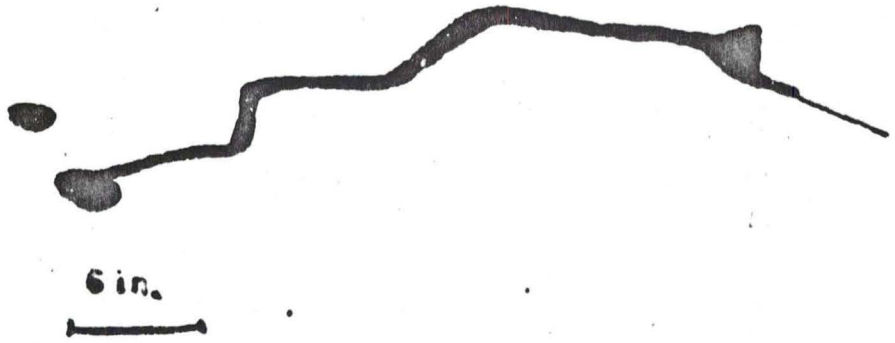


THUNDERBIRD

The thunderbird is a raptorial bird motif which is represented by a falcon, woodpecker, or turkey. In southern Illinois the thunderbird is represented by the turkey. The crest on the turkey is an important give-away. The three buttons on the breast of the turkey may be representative of the beard of a turkey. The beard usually is used as adornments on costumes and has resemblance to a scalp trophy. The turkey is endowed by great magical powers and was given man-eating propensities. The turkey was killed and fed to the fire. The thunderbird possibly represents a supernatural winged being with both human and avian characteristics. Humans did wear costumes imitating the thunderbird. May have dual representation of peace (white color) or combat (red color).

SERPENTINE

Serpentine motif is commonly associated with the rattle snake which is common to Southern Illinois. Both snakes show characteristic zig-zag body outline. The snake appears to have antlers. Antlers are important costume items among Eastern Woodland Indians. They symbolize rank or chiefly and sacred powers. This snake is ascribed chiefly powers.



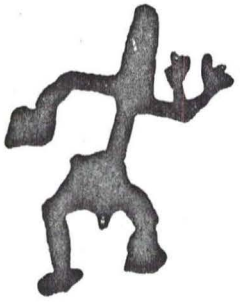
SERPENTINE

This snake illustrates well the rattler on the tail and seems to depict motion. The oval shaped item above the head may be the open eye motif which is commonly found with the circle and cross. The open eye suggests the ability of great powers to see all.

Serpentine motif represents all the chiefly powers below, or the 'water creatures'. They are in constant warfare with the powers above (thunderbird). Great storms result from the battles. Contests between powers created imbalance and warfare between Indians. Also, it is associated with rain, thunder and disease. This power is given equal importance as the thunderbird. It can be used in both red (war) and white (peace) contexts.

SPIDER

This petroglyph consists of a spider with a overlapping turkey track. The spider commonly has 3 legs extending on two sides of the body. The body usually has a circle and cross motif. The spider represents a water creature which brought back the sacred fire. The turkey track symbolizes the turkey (thunderbird) motif and perhaps its battle with the below water creature.



ATHLETE

God-Animal representations by humans take on symbols as warriors, priests, and athletes. This human representation is more like an athlete. The legs and two hands show motion, like playing a game. A common game played during the ceremony is the 'chunky' game. There may be a chunky stone in one hand. A breech cloth is evident as well. Foot games had strong religious significance often finding towns playing towns.

HAFTED AXE AND PIPES

These symbols represent artifacts commonly associated with religious or social activity. Hafted copper axes are frequently found in caches and in burials. These tools can represent the chiefly power or status of certain individuals. Two pipes are evident. These pipes are considered elbow pipes and probably used in both peace and war contexts. The calumet ceremony was used by Plains Indians for councils between tribes and symbols of strong cohesion. Large inter-tribal trade networks are associated with the calumet.

CORN

The corn symbol is not a major symbol for the Green Corn Ceremony. Nonetheless, corn is an important element of Mississippian life as food and fertility. The strong agriculture food base required strong ritual support in the form of ceremonies at corn harvest time. Also, a time to promise good crops next year.

Cemetery

The Indians of the latest occupancy used stone lined (boxed) graves, which was the preferred method used in the Ohio River Valley. Burial mounds are found to the north of this area. Within the stone box grave was placed the remains and other items felt to be of use to the person departed. Cemeteries are usually found away from the general habitation area. Burials are often in the fully extended position allowing childrens graves to be distinguished from adults. The worth of a stone box grave to an archeologist is considerable when questions as to social and environmental concerns are expressed. Within these graves often has been found adornments that allow a rare insight into the past.

The unfortunate situation that exists at this site is that the graves have long ago been completely destroyed as to content and undisturbed condition, by relic hunters.

Previous Indian occupants did not leave evidence of cemetaries and there still exist the possibility of determining answers to many questions about social and biological aspects of Mississippian society. What did these people look like? Skeletal remains can show age, sex, population type and diseases. Did these people have diseases? Study of bone pathology can show cases of lesions, arthritis, malnutrition, syphilis, healed breaks, remnants of operations. People dependant on agriculture have shown a trend towards protein deficiency.

VILLAGE SITE

The Mississippian culture centered around large religious, ceremonial and governmental centers with outlaying farmsteads and small communities. In a typical village the houses were arranged in a circle around the central plaza. The plazas often exhibit leveling to form the area of use.

The houses either, sub-rectangular or rectangular, were placed more or less evenly around the central plaza. The location of the houses relative to the plaza represented significance in either social or governmental functions. House size tends to increase through time. Houses were inhabitated by extended families while other structures were used as communal centers. Farmsteads might have only one or two structures and would usually be located in the bottom lands adjacent to the fertile fields used for agriculture. These helped supply food to the larger ceremonial centers as well as sustaining local populations.

The large ceremonial centers in the bottom lands are typified by the construction of large earthen mounds. The main city of this culture was Cahokia and is said to have tens of thousands of inhabitants. Smaller regional centers include Angel Site in Indiana and Kincaid Site in Massac County, Illinois.

This village site on Millstone Bluff is typical of what one would have found over the area before modern farming and other land distributing activities occurred. The isolation and small size of the area on top of the Bluff saved this area from farming and subsequent blurring of the evidence of occupancy.

This type of village with a central plaza is typical of Mississippian settlements. The area of the houses appear as depressions today. Were they in fact partially dug into the ground? What benefit would that have been? Where was the food for this village and the larger centers such as Cahokia grown? Nearby river bottom may have provided the fields for this. Could what happened to these people happen to us?

Many unanswered questions remain about these mysterious people. Only through careful study will answers become available. If these areas are to provide the answers, we must all become involved in their protection.

This village site complete, with cemetery totally looted, represents a rare find and valuable asset to the American heritage.

STONE WALLS

The so-called "Stone Forts" of Southern Illinois have been a mystery for a long time - there exist 10 rock enclosure areas attributed to prehistoric people in Southern Illinois.

Several theorys exist to explain why the Indians went to such an effort to build these enclosures: defensive fortifications, pounds, or game traps and social/ceremonial rites.

The stone forts are known to be of the late Woodland period and on Millstone Bluff the area was also occupied by the Mississippian culture.

The more credible theory advanced by archeologist John Belmont and Frank Racherby (1973) says that the contact between the Late Woodland and

Mississippian cultures in the Ohio River Valley brought on a competition for the same resources resulting in open hostilities. The Mississippians drove the Woodland pople back into the hills into defensive positions before the final conquest or absorption into the Mississippian social framework. This theory makes these enclosures forts, or safe areas, used to seek refuge in times of danger. An alternate theory is that the Late Woodland groups utilized forts to protect their territories needed to sustain local populations from each other. Population increase was placing strains on these sustaining areas particular with competition for agriculture land.

VIII Selection of Media

With obvious examples of a village site, petroglyphs, cemetarys, stone walls, and millstones, simple interpretive signs or displays located at each example either explaining the feature or raising questions to be considered would be appropriate. A natural appearing area like this needs simple unobtrusive displays to keep with the naturalness of the area and to not break the undisturbed nature of the area low profile and low contrast signing or displays are desired.

An estimate of use expected for Millstone Bluff equates to approximately 25 people per day spending 2 hours apiece. When a $3.00 per recreation visitor day is assigned the present net worth becomes $24,585. To take credit for the entire amount would be unrealistic as use of the area without interpretation would also be of value. A present net worth of one half of the total value for use of the area is selected as the value of the interpretation added to the areas recreations worth. The

amount of $12,292 then represents the estimated maximum amount that could be invested and retain a positive cost benefit ratio. An assessment of facility needs and interpretive methods narrows down to outdoor exhibits with trail access.

With the low expected use no justification can be made for any type of indoor or manned facility. However, volunteers could be used and some manning done on high use days. Full time manning during recreation season would be impractical due to expected use. Comparing six different methods of presenting the interpretation, brochure, interpreting the features of the area, use of a radio transmitter with taped messages, metal photo signs, wooden signs, stone monuments and fiberglass embedment, fiberglass was estimated as cheapest with the brochure system the most expensive. While brochures are cheap to prepare they are costly to administer. The more vandal resistant the medium generally the cheaper it is when discounted to present net worth.

IX Media Design and Construction

See Appendix I for cost estimates of media studied. The better procedure on media selection would be to secure a finalized interpretive plan then with stories in hand select the best medium to carry your message. (For this report the interpretive stories are all that can be completed). The following discussion represents some of the advantages and disadvantages of several mediums investigated.

The use of phamplets or brochures and station numbering, while relatively cheap to produce initially, defer cost until later. This

creates a situation dictating future expenditures that may not be available. This procedure is considered as infeasible.

To explore the electronic side, in methods to provide the information, we find several advances being made that is correcting some of the major disadvantages in the past use of electronic information dissemination. New electronic simulation is doing away with the old tape system thus reducing one of the problem areas. However the radio message system while quite adaptable to a museum or exhibit hall would present several insurmountable problems in an outdoor context. The major one being of requiring a receiver by each visitor and/or a way of issuing and retrieving the receiver at the site. This system is also considered infeasible.

Dropping these two systems leaves us with outdoor displays or signs that can be left unmanned at the site. The four principle types of signs investigated are, wood, stone, metal photo or metaloy, and fiberglass embedment.

Wood - This type of sign is relatively cheap to produce but expensive to maintain. This material does have some adaptability to art but is limited in the use of colors. This medium can be made to achieve the objectives of low profile and low contrast for this particular area. This material would be compatible to the area.

Stone - This type of sign is expensive to produce but does have a low maintenance associated with it. The medium would have about the same adaptability as wood for art work. The use of colors could be inappropriate on this particular medium. This medium could be made

to achieve the objectives for this area. In a stone laden environment this medium would have a high degree of compatability.

Metal Photo or Metaloy - In costs to produce the medium is similar to wood to produce but cheaper to maintain. The reproduction of replacements are cheaper as this is a photo process. Some of the costs are in securing the original negative and subsequent copies of the sign are cheaper. The adaptability to art is great but the use of color is limited to the back ground, two colors and letters of two colors, silver and black or bronze. Experience shows the dark background and silver letters to be the most vandal prone. This medium can be made to achieve the objectives and can be compatible with the area.

Fiberglass Embedment - This medium appears the cheapest to produce and reflects the greatest adaptability to the use of art and color. This creates a medium with excellent flexibility in meeting the objectives. Maintenance would be similar to metal photo but replacement cost might be higher. The vandalism potential is less than wood but might be higher than metal photo. There is little experience to draw on for this particular medium and a judgement call would have to be made to say this medium was clearly in the front in rankings.

In summary fiberglass embedment appears to be the best medium available. The use of skillfully designed panels mounted on stone slabs or monuments would allow the compatability of one system to add to the flexibility of the other. Further investigation should focus on the use of these two media together.

The following ENvironmental Assessment documents are for this project. Different formats may exist that would need to be followed for different forests.

Environmental Assessment Report

STAGE I

I. Project Proposal

Interpretation of Millstone Bluff, National Historic Site. The Primary objectives are public education for protection of cultural resources and recreation enhancement. The project consists of renovating one of the trails leading to the ancient village site with elimination of all the remaining trails and providing interpretation of the major features. The major features to be interpreted are: The millstone on the north slope, the petroglyphs on the north and northeast rock ledges, the stone walls, the cemetery and the village site. The vehicular access will be by the presently open road to the old lime stone quarry and ten car parking lot. The trail standard proposed is primitive with easy grades and steps only where barriers to easy access exist - no grade over ten percent, no step over seven inches high with tread a minimum of twelve inches wide. Interpretive messages written for median education level of general public.

II. Issues, Concerns and Opportunities

a. Public awareness as it relates to Forest Service objectives in protecting archaeological resources.

b. Archaeological site protection.

c. Recreational opportunities, experience enhancement and greater appreciation of areas prehistoric use.

III. Evaluation Criteria

a. Effects on public understaning of need for archaeological site protection.

b. Effects on the cultural resource.

c. Effect on the recreational experience.

d. Effect on prime farm, range and forest land.

e. Effect on threatened and endangered species.

f. Effect on wetlands and floodplains.

g. Effect on visual resource.

h. Effect on civil rights, job opportunities or the economy.

IV. Alternatives

1. No action - continue unrestrained access with no interpretation.

2. Provide interpretive signing designed to both inform about the area and solicit protection for cultural resources. Use primitive trail to channel users to points of interest. Types of signs to be developed after Interpretive Plan is finalized.

3. Provide as in Alternative #? but also provide partial manning during high recreation use season.

Initial Review and Concurrence:

Primary Staff Area _____ Date _____

Environmental Coordinator _____ Date _____

Forest Supervisor _____ Date _____

Environmental Assessment

Millstone Bluff Archaeological Area

T12S R5E 3rd P.M. Section 17 and 20

Pope County, Illinois

I. Proposal

Provide interpretation and protection of the archaeological features found on Millstone Knob. The need for providing public education for the protection of this and other sites and the need to enhance the recreation experience are the main objectives.

II. Issues Concerns, and Opportunities

A. Public awareness as it relates to Forest Service objectives in protecting archaeological resources.

B. Archaeological site protection.

C. Recreational opportunities, experience enhancement and greater appreciation of areas prehistoric use.

III. Evaluation Criteria

A. Effects on publics understanding of need for site protection.

B. Effect on the cultural resource.

C. Effect on the recreation experience.

IV. Alternatives

A. No action - continue as at present.

B. Provide interpretive signing designed to both inform and solicit protection for cultural resources. Use primitive trail to channel users to points of inerest.

1. Use stone medium.
2. Use fiberglass embedment medium.
3. Use metal photo or metaloy medium.
4. Use wood medium.

C. Provide interpretive signs, trail and partial manning during high use season (Recreation season).

V. Alternative Analysis

None of the alternatives will impact civil rights, flood plains, wetlands, prime lands, threatened or endangered species, job opportunities or the economy.

This action could effect the cultural resources. A seperate analysis of different strategies for the alternatives will be made to evaluate the cultural impact since this is a cultural resource site.

Alternative 1

No action (continue present management)

Presently, no interpretative facilities exist and no formally maintained trails. Tours are conducted as budget and manpower permit on a request basis. Approximately one man week of patrol is expended on a random basis

of about 45 minutes per patrol over the year, with emphasis on spring and fall seasons. Area is posted with signs declaring the area protected under federal law.

A. Public Understanding

The using public is presented conflicting stories as they see signs declaring the area protected by law against damaging and dug graves dramatically showing recurring damage. Intuitive reasoning suggest that the moral of "not getting caught" is the main message portrayed here. The portion of the users being conducted by guided tour probably does not exceed 10% of the users and may only represent 1%. Another aspect of continuing present level of management is its lack of visibility in portraying concern for the value of this area. A recent court case in Oregon acquitted three men charged with damaging an archaeological area partially because of lack of evidence that the property was considered valuable. The jury felt both signs and fences were needed to show value was placed on the area.

B. Effect On the Cultural Resource

Present management is looked at as the barest minimum effort that could be expended. The inability to cover the area with protection 100% of the time allows slow degradation to continue. No doubt valuable information is being lost that would help piece together the story of the occupants and what became of them. A general lack of concern for protecting archaeological sites will continue in the using public.

C. Effect on the recreation experience

The opportunity to visit the area while never denied anyone was enhanced for only a small portion of the users by guided tours. The low level of contact with the users explaining both the story of the Woodland and Mississippian peoples and the need to protect the area will continue at a low level. The opportunity to increase public enjoyment will be lost and the majority of users will have limited understanding of what Millstone Knob really represented in the prehistoric era.

Alternative 2

Provide unmaned interpretive signing designed to both inform and solicit respect for cultural resources. Use primitive trail to channel users to points of interest.

A. Effects on public understanding of need for site protection.

Contact, through the written message, will be made with all users of the area. The importance of protecting the area will be brought home to the majority of the users. The trail will channel most users to the points of interest and will better insure the unguided visitor gets to see and perhaps understand what Millstone has to offer. A convincing story on the need for public understanding of protection can be told using the resources of Millstone as an example.

B. Effects on Cultural Resources.

An increase in the number of people made aware of the need to protect these type resources is expected. A consequent reduction in

vandalism is expected both at Millstone and other sites.

C. Effect on recreation experience.

A greater number of users will be able to understand what has occurred on Millstone and an enhancement of the experience will occur.

Alternative 3

Provide interpretive signing, trail and partial manning during high use season.

A. Effects on public understanding of need for site protection.

An increase in public contact would occur with subsequent benefits in protection. However, manpower and budgetary constrains will require additional people to be volunteers.

B. Effects on Cultural Resources

Greatly improved protection would be provided by full time attendant, however, manpower constraint would dictate that a volunteer would be needed to provide this service.

C. Effect on the recreation experience.

An improved experience could be expected from a trained interpreter at the site. However, manpower constrains dictate that a volunteer would be needed to fill this position.

Prepared and

Recommended by: _____
ROGER F. BUCKLEY
District Ranger

Reviews

_____ _____
Signature & Date Signature & Date

_____ _____

The proposed action have a significant impact on the human environment and therefore an Environmental Impact Statement be required.

Responsible Official: _____
Kenneth D. Henderson
Forest Supervisor